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ABSTRACT

A non-anthropocentric view of humankind's relationship with nature is addressed in these essays which are a part of an ongoing series of working papers on technology. The first essay, "Extremist Conceptions of Man and Nature" by Eric Katz critiques three popular philosophies regarding nature and the environment that are believed to be misguided and ineffective. A paradigm of harmony or "ecopiety" in which humankind is attuned to both itself and to nature is offered in Hwa Yol Jung's essay. "The Arrogance and Banality of Technology: A Critique from the Perspective of Deep Ecology." Ecopiety is meant to subvert and transgress anthropocentrism and thereby harmonize humans with nature in a spirit of reverence for all earthly beings and things. In the third essay, "Technology and the Healing of the Earth," Thomas Berry reviews the question of human/earth relationships through a cultural/historical approach on a species level. He proposes the need for a mutually enhancing human/earth relationship that focuses on bioregionalism, appropriate technology, and a less wasteful and unjust distribution of human goods. The final paper, authored by Donald St. John, contains summaries, comparisons, and commentaries on the three presented essays. (ML)

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Technology Studies Resource Center
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TECHNOLOGY AND HARMONY WITH NATURE

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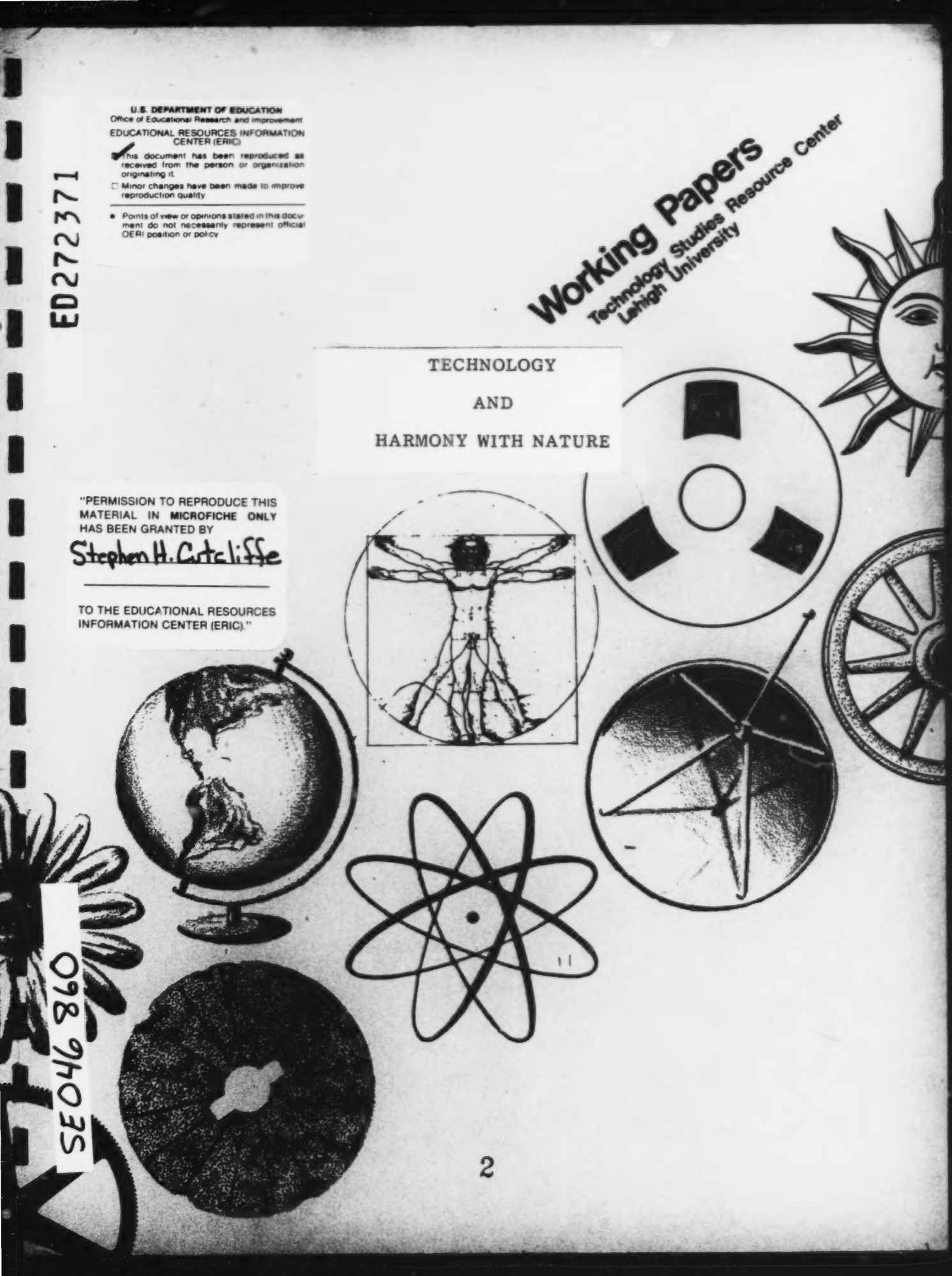

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TECHNOLOGY STUDIES RESOURCE CENTER

WORKING PAPERS SERIES

Stephen H. Cutcliffe, Editor

VOLUME 4, NOVEMBER 1985

TECHNOLOGY AND HARMONY WITH NATURE

Contributors iii

Preface v

Extremist Conceptions of Man and Nature
Eric Katz 1

The Arrogance and Banality of Technology: A Critique from the Perspective of Deep Ecology
Hwa Yol Jung 33

Technology and the Healing of the Earth
Thomas Berry 57

Technology and Harmony with Nature: A Response and Commentary
Donald St. John 83

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COVER DESIGN

The cover was designed by Alan Cutcliffe to represent the broad spectrum of topics in both the humanities and technologies covered in this working papers series. The central symbol of daVinci's universal man is juxtaposed with a multiplicity of images associated with the humanities and technology, all echoing the circular shape, hence the globe, gear, computer disk, grindstone, flower, atom, satellite dish, wheel, and sun. The choice of images also juxtaposes the modern with the historical, the philosophical with the practical, an intentionally thought-provoking contrast of scale and topic, corresponding with the intent of the series itself.

Copies of the TSRC Working Papers Series are available prepaid at $6.00 each (checks payable to Lehigh University) through the Office of the Bursar, Alumni Memorial Building #27, Lehigh University, Bethlehem, PA 18015.

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PREFACE

"Technology and Harmony with Nature" is the fourth in an ongoing series of working papers being published by Lehigh University's Technology Studies Resource Center. The publication of this working papers series, in association with the Regional Colloquium for Technology Studies which serves as the major source for volumes in the series, is designed to help foster a regional research community in this field. It is our hope that the publication and distribution of papers from each colloquium in a working papers format will stimulate new research, facilitate wider dissemination of research and ideas, encourage peer response and adoption as ancillary texts for appropriate courses, and increase opportunities for these papers to be selected for subsequent publication in formal journals and anthologies after appropriate revision.

The Regional Colloquium for Technology Studies and the associated working papers series are activities of Lehigh University's Technology Studies Resource Center. The TSRC is engaged in the creation and dissemination of materials and programming that will lead to a greater understanding of technology on the part of a wide range of audiences, especially their understanding of the mutual interaction of technology and social institutions and values. Among other functions, the Center serves as a focus for academics from all disciplines to collaborate in pursuing research and educational opportunities in technology studies, both with academic colleagues and in conjunction with non-academic sponsors. The Regional Colloquium

and working papers series are just two vehicles within the Center's many activities that are intended as means for expanding our understanding of the social context of technology in today's world.

The Colloquium from which the essays in this volume are drawn was organized in order to explore the philosophical and ethical relationships of technological development and the natural environment. The program was co-sponsored by Lehigh University's Department of Religion Studies and the Institute for Ecosophical Studies located at Moravian College. The Institute is devoted to a reexamination of the earth-human process in the hope of establishing ecological harmony between humankind and nature.

Although the approaches of the authors vary substantially, all three papers in the volume argue for a non-anthropocentric view of humankind's relationship with nature. In the first paper Eric Katz offers a sharp critique of three popular, but in his mind misguided and ineffective, philosophies regarding nature and the environment. For Katz, the fundamental flaw in these popular views is rooted in their "blindness to the existence of an independent nature." For Katz, "ethics can no longer be the search for the good life for man; to develop a sound environmental policy, it must also search for the good life for nature." Thomas Berry reviews the question of human-earth relationships through a cultural-historical approach on a species level. He offers hope by proposing a "mutually-enhancing" human-earth relationship that involves a change in scale, type and form of development that focuses on bioregionalism, appropriate

technology and a less wasteful and unjust distribution of human goods. Hwa Yol Jung takes a more philosophical view of the problem, which he views in terms of a level of thought that overemphasizes technological thinking and the ideology of progress. He suggests a paradigm of harmony or "ecopiety" in which humankind is attuned both to itself and to nature. Donald St. John's response and commentary rounds out the volume. St. John finds all three papers, although different in approach, helpful in pushing us toward a richer and fuller, yet still practical, understanding of humankind's relationship with the natural world. Taken as a whole then these essays offer a variety of philosophical and ethical entry points into important questions regarding humankind's relationship with nature and the earth.

Comments or queries on the Working Papers Series, the Colloquium for Technology Studies, or the Technology Studies Resource Center are welcome and may be forwarded directly to me.

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EXTREMIST CONCEPTIONS OF MAN AND NATURE

Eric Katz

I.

I begin this talk by a sharp, but obvious, criticism of the practice of philosophy: discussions of environmental policy are not helped by the vague generalities espoused by contemporary moral philosophers. Even a brief canvass of recent "ecophilosophical" literature will reveal oversimplications that are startlingly inappropriate and impractical. Philosophers may take each other seriously, but few practical policymakers do. One recent contributor to the journal Environmental Ethics claimed that only eleven articles in the first six years of the journal had any practical relevance to his work as an environmental scientist.[1] And this criticism is from an academic! What professional policymakers in the public arena think of the scholarly philosophical literature is too distressing to consider.

I find the practical ineffectiveness of scholarly philosophical analysis in the area of environmental policy quite disturbing, both as a professional philosopher and as a citizen concerned with environmental affairs. Why is philosophical analysis considered irrelevant to practical environmental issues? Why cannot philosophers bring their "tools" --precision of meaning, clarity of thought, rational argumentation, systemic world views-- to the problems of the environment in an organized and

helpful way? If you will pardon the expression, why is so much applied environmental philosophy a "hazardous waste" of time?

Perhaps one reason is that philosophers like to raise troublesome questions without providing any answers --just as I am doing now. Philosophers, I believe, tend to see themselves as opening up various lines of inquiry, raising pertinent issues, broadening the scope or sharpening the focus of the investigation-- rather than simply providing a neat philosophical or ethical result. But this tendency to see issues and problems in areas where non-philosophers want <u>answers</u> is, of course, extremely frustrating to practical decision-makers. Practical decision makers want results, facts, and answers --not more problems and questions. Thus the disrepute in which philosophy --as an applied discipline-- falls.

A more serious reason for the irrelevance of applied environmental philosophy, however, is that the framework of inquiry provided by the philosophical questions is often misguided or inadequate for practical decision-making. If an applied philosophical "answer" is really just a "study guide," a set of fundamental questions designed to produce further inquiry, then we must admit that the philosophical answers so far produced in the realm of environmental ethics are poor. These answers may be logically, rationally, or philosophically consistent; they may be the expression of an intuitively appealing world view; they may even make practical <u>political</u> sense --but all in all, they fail to bring together hard philosophical analysis and practical

environmental decision-making. They do not produce results.

Let me be more specific. In this talk I will examine three philosophical conceptions of man's relationship to nature. All three conceptions, I believe, are held by some contemporary philosophers interested in environmental affairs. No one person holds all three positions --indeed, this would be impossible, for the positions often contradict each other, and are used (sometimes) to counteract each other. All three conceptions have been influential in shaping public attitudes and philosophical dogma concerning environmental policy. I will argue here that all three conceptions are grossly mistaken. They are superficial, vague generalizations that do little to advance environmental policy --indeed they most likely harm the development of a rational and beneficial human relationship with the environment. Nonetheless, all three conceptions continue to be espoused. They are self-contained, tidy visions of the world and man. But they are too tidy. Man's relationship to the natural environment is both subtle and complex. Thus, over-simplified conceptions of man and nature can give us no knowledge about our place in the universe. They lack practical value in dealing with environmental issues. To continue to use them, I believe, harms the philosophical enterprise.

It should be obvious by now that this presentation will be overtly critical and negative. I do not plan to offer a grand synthesis; nor do I develop any positive conception of my own concerning man and nature. What I show is that certain extreme --yet popular-- conceptions of man and nature have led environmental philosophers in the wrong directions. Before we

can establish a positive conception or world-view we must jettison these extreme misconceptions. We must, to use John Passmore's phrase, "remove the rubbish" of environmental philosophy.[2] However, I will admit to a certain degree of modesty: I realize that one man's rubbish may be another man's treasure.

II.

The three viewpoints I discuss lack official titles --so I will take the liberty of naming them. First is "The World is My Body." From this perspective, each individual human being, each individual subject of consciousness, is seen to be a mere moment in an infinite web of transactions with the rest of the universe. To conceive of oneself as an independent being --both in a physical and in a mental sense-- is a serious distortion of reality. Each individual only exits in and through its interactions with the rest of the world. Physically, we exist because of biological and chemical interactions with the world, and because of an interdependent functioning ecosystem. Mentally, we exist only because of social and cultural interaction.[3] The so-called "outside" world forms the content of our minds. Perhaps the best summary statement of this viewpoint, especially as applied to environmental issues, is that of Paul Shepard:

> Ecological thinking...requires a kind of vision across boundaries. The epidermis of the skin is ecologically like a pond surface or a forest soil, not a shell so much as a delicate interpenetration. It reveals the self enobled and

> extended....as part of the landscape and the ecosystem, because the beauty and complexity of nature are continuous with ourselves... [w]e must affirm that the world is a being, a part of our own body.4

The self is extended to include the entire world.

The second conception of man and nature I call the "Total Natural" view. Here it is acknowledged that mankind is part of the natural system, but the "naturalness" of mankind is taken to its utmost limit. If man is a natural being, then anything man does it natural. The existence of man is the result of a successful evolutionary process; indeed man has succeeded because he is so good at adapting and altering nonhuman natural forces. However man acts to preserve this existence must be a continuation of his natural being. Thus, all man's acts are "totally natural."[5]

The third view may be called "Nothing Natural." According to it, mankind has so altered, interfered with, or affected the so-called natural world that a humanless nature no longer exists. To speak of a man-nature relationship is to pose a duality that lacks one member. There is no nature in itself. Mankind's influence has been pervasive; in a sense, mankind has created a "biotechnosphere" that has replaced the natural biosphere. After all, even the furthest reaches of the globe --the Himalayas or Antartica-- show signs of pollution. Thus, the idea of natural processes functioning in and for themselves is an abstraction that is not applicable to the actual world, a world dominated by human influence.

I trust that my brief characterizations of these positions

renders them understandable and recognizable. They are important, not because of any intrinsic coherence or interest, but rather in the way they affect the determination of ethical principles. An environmental ethic is obviously going to deal with human action in the natural environment. To accomplish this task it will need a framework, a foundation, or a conception of man's relationship to nature. The kind of man-nature relationship envisioned by a particular viewpoint will determine the form and content of the principles in the environmental ethic. The question to be asked then is: "What kind of ethical principles will be derived from each of these three man-nature conceptions?" Once we begin to answer this question we will see what is wrong, impractical, or inappropriate in the three conceptions as a basis for environmental ethics and environmental policy.

III.

The "world is my body" conception is frequently used by advocates of stricter environmentalist policies. It is obvious why this is so. The exploitation and mis-use of natural resources takes place from a perspective that separates --almost totally-- man and the natural environment. If man is not a real part of the natural system, if he is conceived to be different or superior to nature, then nature is conceived as an "other," an entity foreign to or alienated from man. Man thus has no direct relationship with nature except the relationship of <u>use</u>. There can be no ethical interaction as between free, autonomous, human subjects. Nature becomes a mere object, to be used (or abused)

in any way productive of human benefit or satisfaction.[6] The end result is environmental degradation, the practical consequences of the environmental crisis.

But the "world is my body" conception of man and nature radically denies this separation and alienation. Nature is not apart (i.e., separate) from mankind or individual men, but rather nature is a part (i.e., a piece, a constituent) of both mankind and individual men. The world is my body. It is not an alienated other, it is me. Although I can abuse my body, if I so desire, such a desire is rarely considered to be rational. (The practice of jogging notwithstanding.) Acting rationally or ethically requires me to respect my body, my person, my self -- and thus to respect the natural processes and entities that constitute myself. Conceiving of the natural world as part of myself firmly establishes an ethical relationship between man and nature. If, as Kant, for example, taught, one has duties to oneself, then one has duties to the natural world.

Proponents of this viewpoint see clear consequences for environmental policy. One must do as little as possible to intervene in, or harm, the processes and entities of the natural environment. The alteration of the natural environment is an actual alteration of one's own physical and mental self. Consider the pollution of drinking water. A community that uses an aquifer as the source of its drinking water permits the extensive use of agricultural pesticides. These pesticides eventually drain into the aquifer itself. The members of the community drink the water, now contaminated with pesticides, and

so take the pollution into their own body tissue. The pollution in the so-called external environment becomes a part of each individual's physical being. The ethical application of the "world is my body" conception generalizes this simple example to include the entire world biosphere. Whatever happens to any component of the natural system affects me. As environmental scientist-activist Barry Commoner instructs, "everything is connected to everything else."[7] Thus, human intervention in the environment must be severely restricted.

Of course the restriction is not absolute. If one stays within the confines of the metaphor, one can see that certain actions that affect the environment can be beneficial to both natural entities and to human beings --just as certain actions that directly affect a human body can promote the good of the overall individual person. A medical intervention on my body, as the taking of antibiotics to kill an infection, interferes with or harms certain natural bodily processes, and yet the end result is considered a benefit. Intense exercise may actually strain or punish my physical self, but I choose to act in this way to promote my overall well-being. The comparisn with medical procedures is thus appropriate, for the main task facing an environmental ethic based on this conception is to determine what interventions in the natural environment are permissable, just as medical science determines which actions or interventions benefit the health of the individual. If the natural environment is my <u>body</u>, I must know what I can and should do to it to promote its overall well-being, which is of course, also my own.

The second conception of the man-nature relationship, the

"total natural" view, has completely different implications for environmental policy and ethics. While the "world is my body" view lends support to traditional environmentalist policies of conservation and preservation, this second view aids the "developers" of nature, those who advocate less strict environmental procedures. Again, it should be obvious why this is so. Environmentalist positions are generally based on the idea that man can act either against or with natural processes. There is an assumption that the actions mankind generally performs are "artificial," not natural, that they augment or modify strictly natural processes and behaviors. Human culture and its greatest single product, technology, are the causes of this non-natural activity. Consequently, environmentalists can advocate policies that limit or restrict artificial human activity and urge policies that promote a more natural kind of human activity (such as organic farming).

However, on the "total natural" view, any action humans perform is a natural action --part of the natural system-- because mankind itself is the result of a long natural evolutionary process. There is no division between natural activity and artificial/cultural activity. Men act to insure their survival, to preserve their well-being, and to pursue their interests. In furthering these ends, they employ all the means at the disposal of the species. There is nothing "unnatural" or "anti-natural" in any of this. A human community decides to build a dam, blocking the natural flow of a river, in order to generate electrical power. Because humans have developed the

mental and physical ability to accomplish this task, it is a natural act. A community of beavers might also build a dam --and yet no one ever considers their action to be unnatural or unworthy (although it might be adjudged to run counter to human interests). Why then, should humans be condemned for actions that flow out of their natural evolutionary development? The answer, from this standpoint, is that they should not.

The environmental policy implications are thus clear. As long as humans do not perform actions that threaten their survival or their best interests, any policy can be adopted. Since all human activity is natural, no policies of action -- however technological-- can be considered to be unnatural, against human nature or the natural processes of the environment. This guiding principle obviously permits nearly an unlimited development and use of the natural environment. If human technological civilization is so powerful that it alters or harms nonhuman nature, it is not the fault of humanity. The powerful human techno-culture is merely a product of natural historical forces. The entities and processes of nature will adapt to mankind's power, just as they have adapted to other changes in the historical-biological past, or they will not adapt, and thus become extinct. But natural extinction is a fact of the biosphere which human environmental policy cannot, and should not, change. The goal of human action is to preserve humanity, not to preserve nonhuman natural processes.

It might appear that this standpoint of the man-nature relationship permits too much development of nature --indeed, an unlimited development in the furtherance of human interests.

But just as with the "world is my body" view, here too there are reasonable restrictions on the policy alternatives implied by the theoretical conception. Although it is true (from this standpoint) that whatever man does is natural, there are important factual questions about what policies will actually further human interests. Proponents of this position thus face the major task of determining which actions that modify or interfere with nonhuman natural processes serve human interests. Only those kinds of action will be worthwhile --will be rational courses of action. Clearly, this factual task requires a major effort on the part of physical and social scientists. But a sincere effort to determine the limits of human action in the environment will lead to some policies that protect the natural environment.

Finally, we arrive at the third conception of the man-nature relationship, the view I have called "nothing natural." It is difficult to see how policies compatible with an environmental ethic can be derived from this standpoint. In short, I believe that this is the most extreme conception of the relationship between man and nature. Its basic premise is to deny the reality of an independent natural environment. The existence of natural entities and processes uncontaminated by mankind is here considered to be a <u>factual</u> impossibility in the modern world. Ethical policies of action directed towards the preservation of the environment assume, on the contrary, that there is a valuable nonhuman nature. The nonhuman natural world might only be valuable in an instrumental sense, as an object to be used for

mankind, but there is still a natural world to be used. Environmentalist policies can then be developed by determining how this nonhuman natural world should be utilized or acted upon.

Clearly the "nothing natural" conception denies the possibility of these environmentalist considerations. If man and his technology have so modified the natural world that there is no natural entity or process that has escaped human influence, then there is no natural environment that needs to be preserved. Environmental policies of preservation become meaningless. To restrict the building of a dam in order to preserve a free-flowing river and its special kind of wildlife is a naive and futile policy alternative. The free-flowing river has, in actuality, already lost its natural character. Houses and docks, for example, have been built along its banks; perhaps sections have even been bulkheaded. Human waste products and pollutants have been dumped into the river. Birds and wildlife may have been scared (or hunted) away. In sum, the idea of the river as a natural entity existing in some pristine state prior to human development is no more than a myth, an idea that does not exist in reality. To premise a policy on such a myth surely makes no sense.

Again, the general policy implications of this standpoint are also clear. If there is nothing natural to be preserved, then human activity can take any form that it desires. There will be limitations to this activity based on human life, culture, and society but no limitations based on the good of the natural environment. After all, there is no "natural" environment, just a world of interacting human, nonhuman, and

technological influences. Again there will be important factual questions to be decided concerning which human actions promote or harm human well-being, but now these issues can be discussed solely from the standpoint of human life and culture. Nothing truly natural exists in reality. There can be no ethic based on consideration of the natural environment.

IV.

Before criticizing these viewpoints and their policy derivations, let me first briefly note two interesting similarities that exist among the three conceptions. The discovery of similarities among these views is rather surprising, since the policies derived from them seem so antithetical. The "world is my body" view seems to promote strict environmentalist policies, while the other two conceptions clearly tend to less environmental protection.

Nonetheless, the three conceptions share both a factual and a theoretical common ground. On the factual side, all three theories face the practical issue of determining what policies of environmental action promote human well-being. For the "world is my body" conception this task also includes determining the well-being of the nonhuman natural environment, but only because it interacts so completely with human individuals and human society that it can be conceived as part of humanity. On the "total natural" view any activity man performs is natural, but some might lessen the prospects for human survival or happiness. Thus, these negative activities must be identified and

avoided. And finally, on the "nothing natural" view, all that is required of ethics and public policy is to determine the effects of actions on human life and society. Nothing but humanity and its human "biotechnosphere" exists to be taken into account.

All three conceptions then face the practical task --as old as ethics itself-- of determining the good life for man. But the new wrinkle to the old problem is that humanity must now understand through scientific means the way human activity impinges on the nonhuman world, and more importantly, the way the nonhuman world affects mankind. All three conceptions can thus agree on the need for massive scientific, ecological, biological, psychological, and sociological data to determine the effects of man and nature interaction.

On the theoretical side, all three conceptions are essentially anthropocentric: they are literally centered on the life, interests, and well-being of man. This is easy to see in the latter two views. Since on the "total natural" conception any action of man is considered to be in harmony with natural processes, the only question of value concerns the benefit or harm done to human life or projects. Simiarly, the "nothing natural" view denies the existence of any purely natural process or entity. "The trail of the human serpent lies over everything," as William James tell us.[8] The entire world feels the effects of mankind, so mankind is the central focus of all value discussion. Indeed, since a pure nature is a myth, there can be nothing else besides human interests to consider.

More interestingly, however, the "world is my body" view must also be considered anthropocentric. From this position, the driving force of the argument for environmental protection is that the so-called nonhuman natural world is actually a physical and mental part of the life of humanity and individual men. Human decision-makers are asked to consider and care for the natural world because of a new recognition that the world is part of human life. A phenomenologist, Don E. Marietta, Jr., who has been quite influential in the field of environmental ethics, noted this several years ago when he argued in favor of a new enlightened anthropocentrism. "Anthropocentrism...will not encourage man to abuse the world because the concept of man will include the world as mankind's common body."[9] What is significant for man is man; the nonhuman world gains its significance through its essential interaction with mankind.

All three conceptions thus imply a system of value, indeed, moral value, in which only human beings (and humanity as a whole) are important, worthwhile, or significant. None of these standpoints permit the possibility of <u>direct</u> moral consideration of nature or natural entities. Nature can be valued, if at all, in only a secondary or derivative sense, as it interacts with mankind. All three conceptions of man and nature, although radically different, espouse an essential anthropocentrism. Even in the contemporary world with its new environmental crisis, man is still the measure of all things.

V.

I cite these similarities because I believe they underlie what is wrong with all three conceptions of the man-nature relationship. All three conceptions are seriously mistaken: they are based on fundamental assumptions that cannot help us understand or solve the environmental crisis. But this is not always easy to see. Instead, the fundamental flaws in the three conceptions become manifested through a series of practical problems faced by policy makers.

Thus, I will now criticize these three conceptions from a practical or operational standpoint. I hope to show how the vague generalities of these conceptions are both insidious and dangerous to rational understanding. Then, I will argue that the practical problems faced by policy makers are a result of the one fatal fundamental flaw in all of the theories: the anthropocentric attempt to understand the interaction between man and nature. We can begin the practical criticism by asking the following question: Can human policy makers really use any of these standpoints to understand the environmental crisis, to determine policy goals, or to initiate effective action? Hardly.

First, consider the popular pro-environmentalist conception, the "world is my body." As a slogan to remind overly anthropocentric humans that they are related to, and interact with, a complex natural world, this view may be acceptable. It may serve to remind decision-makers of the importance of ecological relationships; it reminds us to take into account the effects our actions have on the nonhuman world. But as the

literal truth, or as a guide to the determination of policy, the idea that "the world is my body" is simply naive. It makes no practical sense because it is too vague. This is easy to see, once we begin to play with the metaphor a bit. Consider the possible extinction of a rare species, such as the snail darter, which recently interfered with the completion of the Tellico Dam in Tennessee. If the world is my body (as this conception states), then I can ask --and I am not being flippant-- exactly what part of my body is the snail darter species? If it corresponds to my liver, without which I cannot survive, then its possible extinction is a matter of grave concern. But my intuition tells me that this is much too high a value to place on the snail darter. If it is a part of my body, it is more likely a part like my beard or my toenail. It is a part of my body I can live without; and indeed, it may be a part of my body I need to manage --I need to shave my beard and trim my toenails. In a similar fashion, I may find it necessary to manage --to alter or modify-- the lives of the snail darters above the site of the Tellico Dam.

I realize that I am having a bit of fun at the expense of a serious environmental metaphor. But there is a serious point to my joking. As it stands, the idea that the "world is my body" is too vague to be of any practical use. I do not preserve all the parts of my body in a natural pristine state. I do not protect or even keep all the parts of my body. (I have five pounds around the waist that I would like to lose immediately.) Thus, the conception cannot help us determine policy unless it gets

much more specific. From this conception we need to derive practical principles that will state how important the natural environment and natural entities and processes are to human survival, to the human body. To stay with the metaphor, exactly which part of the human body is the natural environment, and which part is each of its entites and processes? Do endangered species, for example, correspond to human livers or to human toenails? Does a polluted waterway injure my kidneys or dirty the palms of my hands? The determination of environmental policy based on this first conception of the man-nature relationship needs to answer this kind of question. The idea that the "world is my toenail" will not tend to inspire policies of environmental protection.

A similar lack of specificity mars the second conception of man and nature, the "total natural" view. Again, advocates of less restrictive environmental regulation might like to use the idea expressed here as a slogan, to motivate or inspire more conscious human control over the natural environment. Man has succeeded as a species because he has been able to adapt to, to control, to regulate his environment. This natural ability to survive by modifying one's environment is part of the essential meaning of humanity. Thus, anything that man does to the environment which makes his life better is part of the natural process.

As a reminder that man must interact with and modify the nonhuman natural environment in order to survive, this idea is, of course, reasonable. But as a concept for the understanding of human activity in the natural environment and for the

determination of environmental policy, the idea is, quite frankly, simplistic. The "total natural" viewpoint ignores the clear distinctions that exist among various kinds of human activity. I am not here discussing the validity (or non-validity) of the dichotomy between nature and culture, although such a discussion is clearly relevant and probably decisive in rejecting this second conception. Rather, I want to focus on the extent to which various human activities are in harmony, or agreement, with nonhuman natural processes.

Consider four methods for heating my home. First, my home might be heated electrically --either through resistance heat or some form of air flow/heat pumps-- and this electricity can be generated by the nuclear power plant of my local utility. Second, my electric home system might be supplied by my local utility's coal burning power station. Third, I might decide to avoid the utility's power station by burning my own wood in a wood-burning stove. I buy the wood or cut it myself. Fourth, I might use a system of solar power designed for my individual home --a combination of passive and active devices that completely supply my heating needs. Clearly these are not the only methods that can be used for home heat, but they are enough to illustrate my point that human actions differ in the extent that they agree with or modify nonhuman natural processes. I am not here trying to establish or to ascribe moral value to these methods. I am not, for example, claiming that solar is better than nuclear. All that I want to show is that the activities are different in a non-trivial way. The fact that they are different

undermines the implicit assumption of the "total natural" conception, namely, that all human actions are equally natural.

How, then, are these methods of home heating different in their relation to, and effect on, nonhuman nature? Consider the extent to which they re-use natural resources and the amount of waste material they produce. The solar home uses a nearly steady stream of "free," non-polluting solar energy; it produces virtually no waste material to be absorbed by the environment. The home heated by the wood-burning stove requires the destruction of trees, but these can be re-planted and replaced within a 25-30 year period. The coal-fired power plant, on the other hand, uses a resource that takes millions of years to produce; it is virtually non-renewable. And the emissions from the plant are far worse to the environment (and to man) than the smoke of the wood-burning stove. Finally, the nuclear power plant operates on non-renewable elements of the chemical and geological structure of the planet. It operates for only thirty years and leaves behind waste material that is lethal for thousands of years. These four heating methods are clearly different in the ways they affect nature. I am suggesting that they are also clearly different in the extent to which they are "humanly natural" actions, in the extent to which they harmonize human activity with a well-functioning, recycling natural environment. Proponents of the "total natural" view of man and nature argue instead that human action vis-à-vis the natural environment is monochromatic, but a consideration of these examples shows this idea to be patently false.

This oversimplified generalization, this falsehood, that

whatever man does is natural, obviously cannot guide environmental policy in any meaningful way. As with the first conception of the man-nature relationship, further questions must be answered, further issues settled. For this conception of man and nature to ring true, it must develop a standard to measure the harmony between human activity and what Aldo Leopold called "The Round River," the recycling flow of natural processes.[10]

I have dwelt on the flaws of this second conception because the problems with the third conception are quite similar. Here, remember, the dominant idea is that man's influence on the environment has been so pervasive that "nothing natural" really exists. Even the pristine forests of North America, for example, have been contaminated by the pollutants in acid rain. Advocates of this position, I believe, want to use this pervasive human influence as an excuse to ridicule all attempts at environmental preservation. Only human activity matters because only human artifacts --i.e., human-influenced entities-- actually exists.

This notion can serve as nothing more than a reminder of the influence and power of human action in the environment. As a guide to policy it also suffers from a gross oversimplication -- the denial of essential differences in human effects on nature. Consider the ways in which humans might pollute a stream. First, one might throw into the stream some organic garbage such as food scraps: orange peels, steak bones, apple cores. Second, one might use the stream as a latrine, dumping into it raw human sewage. Third, one might dump human sewage that is somehow chemically treated to reduce its toxic effects

when the stream water is consumed by humans. Fourth, one might dump into the stream non-organic garbage: plastic bottles, metal scraps, rubber boots. Fifth, and last, one might dump industrial wastes, toxic chemicals, into the stream. What should be clear about this list of cases is that they differ greatly in their effect on the natural entity --the stream. To state that no really natural entity exists because of a pervasive human influence on the environment ignores the fact that human influence is of varying degrees. In none of the five cases is the stream perfectly pure and natural, but clearly the first case, in which the stream absorbs some decaying organic garbage, shows less human influence than the fifth case, in which the stream becomes the repository of toxic chemicals. Although human influence may be pervasive throughout all nature, the influence is not an all-or-nothing affair; human effects on the environment can be understood as existing along a spectrum. Some influences are more invasive than others; some influences actually change the natural entity to such an extent that it can be considered to be no longer natural. Other influences might require only minimal adjustments by the natural entity --these do not affect its fundamental character, its existence as a natural being.

Thus, if the proponents of the "nothing natural" view insist on a homogeneous notion of human influence, they will be grossly mistaken and ineffective in the face of actual policy decisions. For this conception of man and nature to make practical sense, there must first be a determination of the spectrum of human effects on the natural environment. The differences among human

activities must be understood as they relate to the alteration or preservation of natural entities and processes. Once this spectrum is determined, practical policy concerning environmental protection can be easily made. It will be the goal of environmental policy to maximize activities which minimally modify natural entities, and to minimize activities which radically alter them. To espouse the "nothing natural" conception of man and nature without noting and using the differences in human activity is to surrender to a vague generalization that cannot aid practical decision-making.

If we take an overview of all three extremist conceptions of man and nature, we find that each requires some kind of further principle to sharpen or to specify the basic notion contained in the viewpoint. Without this additional principle the basic conception becomes useless as a practical tool for understanding man and the natural environment. The "world is my body" conception requires a principle for determining how important a particular part of the natural environment is for man --i.e., what part of the body is it? And both the "total natural" and the "nothing natural" view each require principles for differentiating human actions which affect the natural environment. Certain human actions are more or less natural than others; certain human actions modify the natural environment more or less than others. We require principles for determining which actions are which. But none of the conceptions presents us with a method for determining these precise answers. This lack of specifying principles is the basic practical flaw of each of the

three conceptions.

VI.

Of course it is not difficult to show that any thematic conception or general framework is, in its basic formulation, lacking in specifics. It is also not very important. The practical problems we have discovered here will only merit our philosophical attention if we see that these three extreme conceptions of man and nature are fundamentally vague, that they must leave out the crucial specific principles that they need to make practical sense. They lack the specific principles of practical operation, not because the "detail work" has not been done yet, but because the detail work cannot be done from these various perspectives. There is a fundamental flaw in the basic structure of all three of these conceptions --the perspective of anthropocentrism-- and this flaw ultimately prevents any of the conceptions from providing a clear understanding of the relationship between man and nature.

My argument here returns to the two similarities among the three conceptions that I mentioned above. There I noted that all three conceptions, although starting from different origins, faced the same practical or factual problem. All three views found it necessary to discuss the ways in which human activity in the natural environment affected the well-being and survival of humanity. All three viewes required the infusion of ecological, biological, chemical, and sociological data in order to determine, from their own perspective, the good life for a humanity that interacts with a nonhuman natural world. But now we see that this factual discussion concerning human well-being

is only part of the task. The practical flaw I analyzed in the previous section --the problem of oversimplified generalization, the need for specific principles of differentiation regarding human activity in the natural environment-- shows that what is also required is an understanding of how human action affects nature in itself. The problem discovered in all three conceptions was that they each treated the human effects on nature in an unspecified, homogeneous manner. The entire world is my body, no matter how remote from my physical or mental life. Any action man performs is natural, no matter how it violates or harmonizes with natural processes. No entity that exists is natural because it is somehow influenced by man. In the rush to generality, clear distinctions regarding the specific effects of human action on natural entities and processes were ignored. For these conceptions to make practical sense, these distinctions can no longer be ignored. Understanding how human well-being is derived is not enough. We must also understand how human activity affects environmental or natural well-being. Only then can we distinguish between the various kinds of human actions and develop a sound and ethical environmental policy.

Unfortunately, once we see that the task before us is to understand the well-being of nature itself, we also see that none of the three conceptions of man and nature can provide the necessary framework for the undertaking. The second similarity that I mentioned above was the theoretical idea of anthropocentrism. All three conceptions consider humanity to be the locus of all value, but a doctrine of anthropocentrism will

be unable to consider the well-being of nature in itself. Anthropocentrism denies that there is a value for nonhuman nature in itself. Since man is the measure of all things, nature (and anything else) is valuable only as an instrument, a means, to human value.

From any of these conceptions, then, it will be impossible to determine the idea of the well-being of the natural system. But for any of these conceptions to make practical sense, they will require an idea of a healthy, well-functioning nature: an ecological system of natural entities and processes separate from human modification. Thus, anthropocentrism is now seen to be fatal; none of these conceptions can escape the idea of nature interacting with humanity. None can even conceive of a nature in itself and, thus, none can even begin to develop ideas, principles, or standards of what such a healthy, well-functioning nature should be.

It is this inability, the blindness to the existence of an independent nature, that is the fundamental flaw of all three man-nature conceptions. And it is this flaw, the denial of value for nature in itself, that leads to the vague generalizations I have been criticizing. For unless we understand nature at least as well as we understand humanity, we cannot understand the interaction between man and nature. As this examination of the three conceptions has shown, we substitute oversimplifed analyses of human action for the real understanding of two independent but interrelated systems of entities --humanity and nature. Because we cannot conceive of nature in itself, we focus our attention on human activity along, and thus, we are left with a meaningless

philosophy of environmental action and an ineffective policy of environmental protection.

VII.

Let me conclude with two brief remarks concerning the significance of the foregoing analysis. First, I hope that no one believes that I have been wasting my time knocking down straw men. On serious reflection all three conceptions here discussed do appear obviously problematic; yet they still remain influential among uncritical philosophers and policymakers.[11] It is important that we realize how wrong and ineffectual these views are. They are intellectual "rubbish," and they need to be removed before the development of a sound environmental philosophy and policy can begin. In that sense, then, this talk has been a critical first step --nothing more-- in that development.

Finally, let me amend the statement I made at the start that I would not be offering any positive views concerning the relationship between man and nature. Although the discussion here has been overtly negative and critical, it has obviously been based on a particular and different conception of man and nature than the ones herein examined. And surely I am not revealing any deep dark secret when I suggest to you that we must develop a non-anthropocentric view of man and nature. We must understand both man and nature from a perspective that transcends human interests, human ideas, and human projects. We must understand humanity, not only from its own perspective, but also from the perspective of the nonhuman world. And we must

understand nature in itself, separate from human ideals of it. Ethics can no longer be the search for the good life for man; to develop a sound environmental policy, it must also search for the good life for nature.

NOTES

1. John Lemons, "A Reply to 'On Reading Environmental Ethics'" Environmental Ethics 7 (1985): 186.

2. John Passmore, Man's Responsibility for Nature (New York: Scribner's, 1974), p. 173.

3. Perhaps the most interesting expressions of this conception can be found in authors that actually pre-date the contemporary consciousness of an ecological crisis. See Alfred North Whitehead, Science and the Modern World (1925). Reprint ed. (New York: Free Press, 1967), especially p. 92: "the event which is the bodily life unifies in itself aspects of the universe." See also Gregory Bateson, Steps to an Ecology of Mind (New York: Ballantine, 1972), pp. 426-505, for the mental side of the conception.

4. Paul Shepard, "Ecology and Man--A Viewpoint," in The Subversive Science: Essays Toward an Ecology of Man, ed. Paul Shepard and Daniel McKinley (Boston: Houghton Mifflin, 1969), pp. 2-3.

5. For the importance of valuing human accomplishments over our evolutionary and cultural history, see W. H. Murdy, "Anthropocentrism: A Modern Version," Science 187 (1975): 1168-72.

6. William Leiss has dealt with the alienation and use of nature as a commodity in several books and articles. See his The Domination of Nature (Boston: Beacon Press, 1974); "The Imperalism of Human Needs," The North American Review 259 (1974): 27-34; and The Limits to Satisfaction: An Essay on the Problem of Needs and Commodities (Toronto: University of Toronto Press,

1976). Leiss frequently cites Karl Marx in the Grundrisse: "nature becomes purely an object for men, something merely useful, and is no longer recognized as a power working for itself."

7. Barry Commoner, The Closing Circle: Nature, Man, and Technology 1971. Reprint ed. (New York: Bantam, 1972), p. 29.

8. William James, Pragmatism.

9. Don E. Marietta, Jr., "Religious Models and Ecological Decision Making," Zygon 12 (1977): 164.

10. Aldo Leopold, A Sand County Almanac: With Essays on Conservation from Round River (New York: Ballantine, 1970), pp. 188-202.

11. As this talk was being written, two letters appeared in the New York Times in support of the Shoreham, Long Island, nuclear power plant. Each seems to represent one of the latter two conceptions. In one letter, John Foley argues that a fear of nuclear waste is unfounded, because, in part: "We are all a part of an evolutionary process. The contributions made in the past have made it possible for us to enjoy the advantages of today....I'm sure that 50 years from now, nuclear-developed electrical power will be replaced by something our evolutionary process of learning will by then have developed." This letter seems to be an expression of the "total natural" view. In another letter, Morris Seldin writes: "There has never been a

credible scientific study proving that small amounts of radiation cause cancer or any other ill effects. Radiation is everywhere --soil, sun, rocks, air, water, etc." The "nothing natural" view in a nutshell. See The New York Times (August 25, 1985): Section 11 (Long Island), p. 23.

THE ARROGANCE AND BANALITY OF TECHNOLOGY: A CRITIQUE FROM THE PERSPECTIVE OF DEEP ECOLOGY[1]

Hwa Yol Jung

I.

We have indeed become disenchanted with the world whose dominant prose is written in the language of technology and with the modern condition of humanity which is enframed by the hegemony of technology including the cybernation of knowledge and the computerization of society.[2] In 1982, Time even selected a machine as the "man of the year." We are all wired to, and have become hostages of, the network of technology from whose "channeled existence" there is no exit in sight. Ours is the epoch when technology has become totalizing, one-dimensional, planetary, and terrifyingly banal and normalizing; when the fundamental project of macro-technology threatens to create a vast necropolis for the entire earth and to bring humankind to the brink of collective extinction or what Jonathan Schell calls "the death of death";[3] and when micro-technology claims to have invented a "second self"[4] whose "soul" may soon become, if it has not already become, imprisoned behind the invisible walls of a gigantic Panopticon.[5] In this setting, it is most appropriate to suggest that there should be a philosophy of the technological as an encompassing area of philosophical inquiry. It is clear, moreover, that this new inquiry will become the most important form of critique in an epoch when technologization has become the

rampant and sweeping norm of everything we do, think, and know, that is, when everything is technocentric or technomorphic. Indeed, our dilemma lies in the fact that man is human because he is technological in the most basic sense of the term. Putting it in the langauge of Werner Heisenberg, technology is to man as the shell is to the snail or as the web is to the spider. And yet, on the other hand, man's very physical survival hangs in the balance because of his own artifacts. In Civilization and Its Discontents, Sigmund Freud expressed this dilemma both poignantly and prophetically.[6] According to him, man invented and uses technology for his physical survival against the harshness of nature and then for the comfort of his life. Now, however, he has reached the point where technology has the potential of destroying and obliterating himself and the world.

1972 was a year of momentous events in the ecological movement. The Club of Rome issued its first report called The Limits to Growth, which focused on the dismal condition of the world as evidenced by accelerating industrialization, rapid population growth, widespread malnutrition, depletion of nonrenewable resources, and a deteriorating environment.[7] Also, in that year, a parliament of delegates from all over the world under the auspices of the United Nations held a conference in Stockholm on the human environment, which turned out, for the most part, to be a disappointing exchange of diatribes, especially between the developed and the developing nations, on who gets what, when, and how, leaving us with nothing but the despairing sense of, as it were, repairing a torn spider's web with our fingers --to use

Ludwig Wittgenstein's metaphor. In the same year, the Norwegian philosopher Arne Naess lectured in Bucharest on the intrinsic connection between philosophy and the ecology movement in the name of "deep ecology."

> In so far as ecology movements deserve our attention, they are ecophilosophical rather than ecological. Ecology is a limited science which makes use of scientific methods. Philosophy is the most general forum of debate on fundamentals, descriptive as well as prescriptive, and political philosophy is one of its subsections. By an ecosophy I mean a philosophy of ecological harmony or equilibrium. A philosophy as a kind of sofia wisom, is openly normative, it contains both norms, rules, postulates, value priority announcements and hypotheses concerning the state of affairs in our universe. Wisdom is policy wisdom, prescription, not only scientific description and prediction.8

Naess further noted that the influence of "deep ecology" had yet to gain momentum (although in recent years it has been gaining ground and strength). Indeed, in this light, talk of ecological thinking is still in its infancy. Martin Heidegger could very well have been describing the condition of ecological thinking when he quips about the poverty of thinking in our time: there is interest in thinking today as it is engendered by many thought-provoking events; ironically, however, what is most thought-provoking in our time is that we are still not thinking.[9] By thinking, Heidegger does not mean our ability to theorize abstractly but our inherent ability to make judgments as human beings based on the sensus communis or "common sense" (as in Socratic or Confucian wisdom and Aristotelian prudence) as the abode of man's humanity. It is thinking as a natural propensity

of "examined" life which is a faculty of every man who belongs to the noble species called human. Heidegger calls thinking a "handicraft": "Every motion of the hand in every one of its works carries itself through the element of thinking, every bearing of the hand bears itself in that element. Therefore, thinking itself is man's simplest, and for that reason hardest, handiwork, if it would be accomplished at its proper time."[10] In contrast, thoughtlessness is the condition of inhumanity. In a time of ecological thoughtlessness, we need to attune ourselves to the dire necessity of thinking as a prelude to the radical transformation and reenchantment of the world.

For our purpose here, deep ecology may be defined as an ontological ordering of man and nature in their harmony. Its aim is to create a whole new way of thinking and doing, a new philosophy of life, or a new ecological paradigm. Its approach is radical and holistic. In the first place, it is radical because it attacks the root cause of the ecological crisis. In the second place, deep ecology is holistic as opposed to reductionistic. To put it in the Sinistic frame of reference as exemplified in the I Ching (the Book of Changes), it is "synchronistic." Ecological thinking cannot be otherwise because, as the ecologist and astute critic of technology Barry Commoner stresses, the "first law of ecology" is the interconnectedness of everything to everything else in the universe. For him, the root cause of our ecological crisis is scientific reductionism which practices the investigation of a complex system in terms of the properties of its parts in

isolation.[11] There has now emerged, however, a new conception of science as well as philosophy. In contrast to the conception of science as a completely detached and value-free enterprise, science or scientific activity itself is viewed as an active interplay of man and nature. The scientist is not a passive observer or onlooker but is an active participant on the stage of life in the natural and social milieu. Man and nature, subject and object, and theory and practice are not separate realities but are rather complementary poles of the same reality. Science is indeed a human activity and achievement which is founded upon and necessarily abstracted from the total horizon of meaning and value inscribed in the prescientific, common-sense world.[12]

II.

Anthropocentrism propelled by the ideology of progress is without doubt the root cause of our ecological predicament today. As such, it is the antithesis of deep ecology. Anthropocentrism is an ordering of man at the apex of all creation; one recent author calls it "the arrogance of humanism."[13] According to Loren Eiseley:

> it is with the coming of man that a vast hole seems to open in nature, a vast black whirlpool spinning faster and faster, consuming flesh, stones, soil, minerals, sucking down the lightning, wrenching power from the atom, until the ancient sounds of nature are drowned in the cacophony of something which is no longer nature, something instead which is loose and knocking at the world's heart, something demonic and no longer planned --escaped, it may be-- spewed out of nature, contending in a final giant's game against its master.14

The attitude of arrogance is manifested in modern (Western) man as "historical man." Mircea Eliade shows that by inventing history independent of nature, modern man has replaced the "imitation of nature" with the "terror of history."[15] In The Vocation of Man, Johann Gottlieb Fichte exemplifies this historicism when he writes that "I will be the lord of Nature, and she shall be my servant. I will influence her according to the measure of my capacity, but she shall have no influence on me."[16] Even an apparently innocuous statement such as "man himself is an endangered species" is incipiently anthropocentric or has at least an anthropocentric overtone.

The Christian conception of historical linearism underwrites and buttresses the ideology of progress, and Christian messianism is readily translated by some Christian thinkers, even today, into the new messianism of technology. Progress is progress for man, for man alone. Christianity has been an anthropocentric religion and a spiritual inspiration for the material progress of Western man in the exploitation of nature. The Biblical view of man and nature (like Fichte's) unmistakably expresses the relationship of the master and the servant, setting up a spiritual stage for the sharp division and opposition between man and nature and for the subjugation, domination, and exploitation of one by the other. The Christian philosopher of history Arnold J. Toynbee observes: "God had created the world; the world was his to do what he liked with; he had chosen to license Adam and Eve to do what they liked with it; and their license was not cancelled by the Fall."[17] The term license is best understood in two ways: first, to grant and second, to abuse or trespass.

Genesis (I: 28) speaks of man's absolute dominionship over other living beings and nonliving things in nature. In Christianity as in modern science and technology, nature is desacralized and denigrated. The exaltation of the "spiritual" gift of man endowed by God provided Western man with an impetus and perfect justification for the desacralization of nature as a disposable bundle of materiality. In his celebrated and often anthologized article, "The Historical Roots of Our Ecological Crisis" (1967), Lynn White, Jr. sees the issues of ecology as fundamentally religious, because they are deeply conditioned by man's ultimate concern for his nature and destiny.[18] White is, as is Toynbee, extremely critical of Christianity, the religion of modern (Occidental) man. He calls it the most anthropocentric religion the world has ever seen, and he points out that, unlike "pagan animism," Christianity confirms a man-nature dualism under which, by divine mandate, man gains the monopoly of spirituality and thus is privileged to dominate and exploit nature for whatever he chooses and by whatever means he employs. In the end, White proposes St. Francis of Assisi as "a patron saint for ecologists," for in that saint he finds a Christian, Western champion of the spiritual autonomy of all parts of nature and an enemy of man's absolute spiritual sovereignty over nature. White has opened a floodgate for re-envisioning or recasting Christianity in a more favorable light for ecology.

As for Marxist humanism, it was meant to be an antithesis of Christianity and bourgeois civilization. First and foremost, it is a critique of capitalism whose development was fostered by the spirit of Christianity in the destruction of nature and the

alienation of humanity from both itself and nature. Although from Ludwig Feuerbach to Karl Marx and Herbert Marcuse there is a breakthrough in the conception of man as a natural, sentient, and embodied being, Marx both secularized the vision of the Judaeo-Christian millenarianism in the tradition of the Enlightenment and inherited in significant measure the vision of Hegel's historicist anthropocentrism. Moreoever, it is true that Marx, the young Marx, spoke of a future society based on the union of man with nature or of the naturalism of man and the humanism of nature. His ideal society would eventually emancipate man from the sense of domination and possession and replace work with the free play of leisure. It should be noted, however, that the free play of leisure comes only after material abundance and affluence. In the end, however, Marx was influenced by the English classical labor theory of value which undergirds his conception of man as homo faber. By his toil, homo faber makes useful the wilderness of nature which John Locke called "wast[e]." Moreover, Marx was a victim of the untamed optimism of the Enlightenment for humanity's future progress with the aid of technology. The saga of Marxism has in large measure been an integral chapter in the flow of Western history channeled by the indomitable spirit of progress with the aid of science and technology.

Technology is the kernel of anthropocentrism and the ideology of progress regardless of different political and economic systems. Because technology is a cultural artifact hammered out of the wilderness of nature or intends "the death of nature out of the sockets of iron weapons" (to borrow the phrase

of Vincent Scully),[19] deep ecology as a philosophy of ecological harmony must include a critique of the technological as an integral component.

Science and technology go hand in hand. The conquest of nature through technology for so-called human progress has its foundation in the theoretical sciences of nature, especially physics. It was Francis Bacon who was the poetic spokesman for science and who built an intellectual edifice for and the popular ethos of modern technological-industrial civilization. He was the eloquent, supreme spokesman for progressivist humanism and technomorphic civilization. In pursuit of "earthly paradise," his "enlightened" philosophy of man and nature justified the "greening" of modern scientific, technological, and industrial civilization and, despite all his good "humanistic" intentions, opened Pandora's box. In his philosophy, nature was transformed into the world of inert matter and objects which can be manipulated by calculation and experiment for "utility" (utilitas) and "power" (potentia). For knowledge is power. By increasing knowledge through "the inquisition of nature," man is capable of extending his dominion over nature for his benefit. Bacon envisioned utility and power as laying the foundation for overcoming the necessities and even the miseries of humanity. The framework of modern technology as instrumental rationality was laid down by Bacon when he insisted on the meaning of human knowledge and power as one and found "in the womb of nature many secrets of excellent use." Bacon acknowledged the fact that the fruits of science do not grow on books. In The Advancement of

Learning, he scorned the idea of studying "words" rather than "matter," for "words are but the images of matter; and except that they have life of reason and invention, to fall in love with them is ...to fall in love with a picture." Speaking of "degenerate learning" among the Schoolmen, he felt that they had "sharp and strong wits" and "abundance of leisure" in "the cells of monasteries and colleges" but that they knew little history of nature or "no great quality of matter," i.e., their "cobwebs of learning" produced "no substance or profit."[20]

III.

The Baconian conception of technology as instrumentum or instrumental facilitation for human well-being and progress has now been replaced by autonomous technology. With this radical shift, the traditional end-and-means continuum is reversed: means has become end itself. Indeed, there is no one who captures the essence of technology as autonomous better than Heidegger when he insists that the essence of technology (Technik) is no longer technological.[21] In the first place, technology is a fixed order which is autonomous rather than instrumental. In the second place, to say that the essence of technology is not technological is to say that technology as instrumentum has been transformed into a teleology. Here again, Heidegger's insight into the question of technology is enlightening. He contends that we have yet to grasp fully the nature of technology in which man himself has become its "functionary." Technology is no longer simply a means to human activity or the human telos. For it is not merely the application of mathematical and physical sciences to praxis, but

is rather a praxis itself. As such, the traditional rationale of technology as instrumentum is obsolete. Nonetheless, we continue to justify the "end" of technology in terms of this outmoded idea of instrumentum. In so doing, we still view technology as morally neutral and forget that in technology end has already been subverted by means. In today's world which is dominated by technology, this anachronism constitutes the poverty of moral thinking par excellence. This teleological lag, as it were, shows that the advancement of technology is no guarantee for the advancement of moral thinking. The political theorist Langdon Winner calls this happening of autonomous technology "reverse adaptation" in which "technical systems become severed from the ends originally set for them and, in effect, reprogram themselves and their environments to suit the special condition of their own operation. The artificial slave gradually subverts the rule of its master."[22]

This obsolete way of justifying technology as instrumental is an integral part of that historical process which Max Weber called "rationalization" (Zweckrationalität). Following Friedrich Schiller's expression the "desacralization of nature" (Entgötterung der Natur), Weber called this historical process of "rationalization" the "disenchantment of the world" (Entzauberung der Welt) in his famous lecture on "Science as a Vocation" (Wissenschaft als Beruf) in 1922.[23] Weber's seminal idea of "rationalization" or the "disenchantment of the world," first of all, points to science itself as a motivating force for the progression of modern society and history. "Rationalization"

parallels the historical "progress" of scientific and technological thinking that has displaced the "magical" elements of human thought. It means, according to Weber, that

> principally there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation. This means that the world is disenchanted. One need no longer have recourse to magical means in order to master or implore the spirits, as did the savage, for whom such mysterious powers existed. Technical means and calculations perform the service. This above all is what intellectualization means.24

By undermining or replacing the mystical, cosmic, religious, and moral systems of the past, does not this demystification of the "magical" by way of measurable calculation remystify and even deify the demystified itself? Be that as it may, in the conceptualization of human action, the principle of "rationalization" reduces the rationality of action to the calculation of the most efficient means of achieving its goals. No wonder efficiency becomes the norm of everything we do in the technocratic society.

The "rationalization" of the world continues and is exemplified in and heightened by Marshal McLuhan's philosophy of communication and communication technology. Indeed, he is a philosopher of culture who is also one of the most outspoken apostles of our age as the age of electronic technology or, shall we say, autonomous technology. The quintessential line in McLuhan's advocacy of electronic technology is: the medium is the message. For him, "the 'content' of a medium is like the juicy piece of meat carried by the burglar to distract the watch-

dog of the mind."[25] What would be, we might ask, the content of the human mind if it is not stuffed with enframed images "processed" by technology?

In the last analysis, there can be no ethics in autonomous technology, because it makes obsolete the traditional rationale of technology as instrumentum that serves the telos of man. The reversal of end and means is endemic to technocratic mentality and peculiarly characteristic of autonomous technology. It is an integral and indispensable part of "rationalization" accompanied by the rise and dominance of scientific and technological thinking (i.e., thinking by calculation). To "rationalize" or "instrumentalize" ends is to norm/alize "efficiency" as the end of our conduct -- the operational demand of technocratic mentality and society. The "rationalization" or "instrumentalization" of our conduct is the end of the Kingdom of Ends. The reverse side of this "instrumentalization" is the moral truism or naive moralism that "guns do not kill people; only people kill people." Surreptitiously it invokes the idea of "people."

The "instrumentalization" of ends raises the celebrated question of the "banality of evil" whose opposite is the ethics of responsibility. The "banality of evil" is the profound idea Hannah Arendt coined in order to characterize Adolf Eichmann -- the man who even misconstrued Kant's notion of duty as blind obedience-- as the paradigmatic case of the violent terror of unthinking men or men of moral indifference and to justify the death penalty imposed on him by the Israeli Government in 1962. For Arendt, Eichmann as doer was neither monstrous nor demonic, but the result of this deed was, nonetheless, atrocious. In-

difference or lack of intention to murder does not absolve one's guilt and responsibility for a crime. Objectively speaking, therefore, Eichman was no less guilty and deserving of death than the monstrous or demonic.

In the same way, Arendt's idea of the "banality of evil" can very well be applied to the unintended "evil" consequences of technology itself. First of all, the possibility of moral thinking depends on the notion that we are responsible agents, that is, our ethical conduct presupposes the intentional activation of meaning. To be responsible is to choose one meaning or value over others in the configuration of both ends and means. Second, the ethics of responsibility must not be equated with an ethics of pure intention and principles alone. Nor should it be confused with an ethics of consequences with disregard for intention and principles. One without the other is insufficient because it is one-sided: by focusing on intention and principles alone, one loses sight of consequences, whereas by weighing only consequences, one forgets intention and principles.

The ethics of responsibility must be an ethics of fulfillment in the sense that it fulfills the principled intention of an action in light of the consequences it produces or will produce, whether it be verbal or nonverbal. We do not have to go as far as invoking the uncommon jurisprudential principle that technology is guilty until proven innocent! The "banality of evil" points to the "guilt" or liability of technology despite its allegedly "innocent," "benign," or "good" intention to serve humanity's well-being. Quite often, good intentions produce bad

consequences for which we ought to be held responsible. To reenchant the world, to deconstruct technology, in sum, is to restore the essence of man as moral being. Otherwise, history will indeed be a nightmare from which there is no awakening. When we become "automated" and "cybernated," we cease to be morally responsible agents. The denial of man's moral agency, or nihilism, is implied in, and the end of, autonomous technology. Critique of the technological must without doubt be the subversion of this nihilism.

IV.

In conclusion, I wish to propose the idea of ecopiety for subverting and transgressing anthropocentrism whose essence inheres in technological rationality. To reenchant the world is to harmonize man with nature and to deconstruct the technologization of the world. Ecopiety is abundantly Sinistic. Interestingly, Joseph Needham's monumental treatise on Chinese civilization has been universally acclaimed largely because it shows the high achievement of science and technology in ancient China, the land of Confucius, Lao Tzu, and Chuang Tzu.[26] There is, however, an ironic twist in this slightly misguided acclamation because, Needham's monumental accomplishment notwithstanding, it mirrors our age as the age of science and technology.

Be that as it may, the aim of ecopiety is to harmonize man with nature. But what is harmony? It is a musical concept in which nature may be described as a gathering of many earthly

beings and things as an ordered whole. As it assumes a pluralistic universe of living beings and nonliving things, it becomes a kind of symphony or orchestration of the differentiated many. By using the term differentiated, I mean to accentuate the idea that all beings and things cannot be flattened to a single equation or a fixed formula of equivalences. In this regard, both anthropocentrism and naturalism are equally one-sided, that is, they are false: one overvalues man, whereas the other undervalues the existential eccentricity of man as moral being who is capable of activating meaning and value. To use a Pascalian expression, man is somewhere in the middle between nothing and everything. The term in as in "man in nature" or "man in the landscape" is an ecstatic one in that as an intentional being man is not simply an inert object or matter. In other words, the harmony of man with the nature is man's way of attuning himself or herself to the world both natural and social. Mood modulates the tonality of his or her existence in or in relation to the world. Precisely because mood is not a psychological or subjective category, harmony too cannot be defined as an anthropocentric or man-centered category.

To recapitulate: harmony constitutes the keyboard of understanding reality as social process, for only where there is social process is there reality, and where there is no social process, there is no reality. Harmony is thus not the unitariness of the undifferentiated but a polyphonic chord or orchestration of the differentiated many. By social process based on the musical conception of harmony, we mean an intoned nexus of relationships between man and nature on the one hand and between man

and man on the other. These two spheres deeply affect each other. We name the encompassing principle of social process among all earthly beings and things as ecopiety, which may be divided into two subcomponents: homopiety and geopiety. Thus,

ECOPIETY = HOMOPIETY + GEOPIETY.

Homopiety refers to the conviviality of man with man and geopiety the connaturality of man with nature. As the Greek oikos, from whose etymology both ecology and economics are derived, signifies the "household" (a circle of family, relatives, and friends), both conviviality and connaturality are similarly two different ways of saying filiality, the term for endearment for the Sinistic mind in weaving the basic fabric of social, political, economic, and moral relationships. The unity of ecopiety is "synchronized" in the yang of homopiety and the yin of geopiety as complementary. One cannot do without the other, the combination of which, I might add, is multifaceted.

Above all, ecopiety signifies the attitude of reverence for all earthly beings and things. It is the sacrament of interexistence that affirms the "I-Thou" rather than the "I-It" relationships, to employ the language of Martin Buber. The attitude of reverence should be applied to our own artifacts as well as things social and natural. What is so revealing and saddening about technomorphic mentality, however, is that man is irreverent even to his own artifacts. Junkyards and chemical dumps, for example, show no reverence for man's artifacts and products. Geopiety as reverential composure for the "natural

spontaneity" of nature confirms the intrinsic value of nature as it is itself rather than for its use value, its extrinsic value. It is, I think, the stark contrast between art and technology -- art for intrinsicality and technology for extrinsicality. In Sinism there is an ineluctable connection between the aesthetic and the ethical: the beautiful and the good are intertwined. As the aesthetic is the harmony of man with nature, so is the good the harmonious relationship of man with man. Harmony is, therefore, the essence not only of the aesthetic (the musical) but of the social as well.

In the end, there is no science of the future since the future is unpredictable. That is, it is made by us as responsible agents. The future as history will, indeed, be of our own choosing and making. As Chinese ideography composes "crisis" in the combined characters of "danger" and "opportunity," our option is clear in this time of ecological crisis: we have an opportunity of subverting and transgressing the Great Chain of technocentric civilization toward the reclamation of ecopiety. The prospect of our future depends on this radical and momentous choice and switch.[27] Indeed, at the edge of history, ecopiety offers us a radical way of defenestrating technocentric civilization.

NOTES

1. For extended discussions with full documentation by the author of the issues raised in this paper, see "Ecology, Zen, and Western Religious Thought," The Christian Century (November 15, 1972): 1153-56; "The Ecological Crisis: A Philosophic Perspective, East and West," Bucknell Review 20 (Winter 1972): 25-44; "The Splendor of the Wild: Zen and Aldo Leopold," Atlantic Naturalist 29 (Spring 1974): 5-11; "The Paradox of Man and Nature: Reflections on Man's Ecological Predicament," The Centennial Review 18 (Winter 1974): 1-28; (with Petee Jung), "To Save the Earth," Philosophy Today 19 (Summer 1975): 108-17; (with Petee Jung), "Toward a New Humanism: The Politics of Civility in a 'No-Growth' Society," Man and World 9 (August 1976): 283-306; "The Orphic Voice and Ecology," Environmental Ethics 3 (Winter 1981): 329-40; "The Medium as Technology: A Phenomenological Critique of Marshall McLuhan." Pp. 45-80 in Phenomenology and the Understanding of Human Destiny, ed. Stephen Skousgaard (Washington, D.C.: The Center for Advanced Research in Phenomenology and the University Press of America, 1981); "Language, Politics, and Technology," Research in Philosophy and Technology 5 (1982): 43-63; "The Harmony of Man and Nature: A Philosophic Manifesto," Philosophical Inquiry (forthcoming); "The Piety of Thinking: Heidegger's Pathway to Comparative Philosophy." In Heidegger and Eastern Thought, ed. Graham Parkes (Honolulu: University of Hawaii Press, forthcoming); and "The Genealogy of Technological Rationality in the Human Sciences." In Technology and Human Productivity, ed. John W. Murphy and John T.

Pardeck (Westport: Greenwood Press, forthcoming).

2. For a synoptic survey of modern epistemology including the cybernation of knowledge and the computerization of society, see Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984). For a definition of the philosophy of technology in this modern condition, see Carl Mitcham, "What is the Philosophy of Technology?," International Philosophical Quarterly 25 (March 1985): 73-88. For an extensive survey of the contemporary philosophy of technology with a focus on European thinkers, see Egbert Schuurman, Technology and the Future, trans. Herbert Donald Morton (Toronto: Wedge Publishing Foundation, 1980).

3. See The Fate of the Earth (New York: Alfred A. Knopf, 1982).

4. This is the recent title of Sherry Turkle's study on the state of computer science and artifical intelligence. See The Second Self: Computers and the Human Spirit (New York: Simon and Schuster, 1984).

5. By the Panopticon, I mean Jeremy Bentham's meticulous, architectural plan in the last quarter of the eighteenth century for an ideal prison-house or inspection house. See vol. 4 of The Works of Jeremy Bentham, 11 vols., reprinted from the Bowering Edition of 1838-1843 (New York: Russell and Russell, 1962). For a stimulating interpretive essay on Bentham's Panopticon, see Michel Foucault, Discipline and Punish, trans. Alan Sheridan (New York: Pantheon Books, 1977), pp. 195-228.

6. See The Complete Psychological Works of Sigmund Freud (Standard Edition), trans. James Strachey, 24 vols. (London: Hogarth Press, 1961), 21: 57-145.

7. See Donella H. Meadows et al., The Limits to Growth (New York: Universe Books, 1972).

8. "The Shallow and the Deep, Long-Range Ecology Movement: A Summary," Inquiry 16 (Spring 1973): 99.

9. What is Called Thinking?, trans. Fred D. Wieck and J. Glenn Gray (New York: Harper and Row, 1968), p. 4.

10. Ibid., pp. 16-17.

11. See The Closing Circle (New York: Alfred A. Knopf, 1971).

12. See, for example: Werner Heisenberg, The Physicist's Conception of Nature, trans. Arnold J. Pomerans (New York: Harcourt, Brace, 1958); Thomas S. Kuhn, The Structure of Scientific Revolutions, 2nd rev. ed. (Chicago: University of Chicago Press, 1970); and Stephen Toulmin, The Return to Cosmology (Berkeley: University of California Press, 1982).

13. See David Ehrenfeld, The Arrogance of Humanism (New York: Oxford University Press, 1978).

14. The Firmament of Time (New York: Atheneum, 1960), pp. 123-24.

15. See The Myth of the Eternal Return, trans. Willard R. Trask (New York: Pantheon Books, 1954).

16. Trans. William Smith (La Salle: Open Court, 1946), p. 29. For the most comprehensive survey of anthropocentrism in European intellectual history, see Clarence J. Glacken, Traces on the Rhodian Shore (Berkeley: University of California Press,

1967).

17. "The Genesis of Pollution," Horizon 15 (Summer 1973): 6.

18. In Machina ex Deo: Essays in the Dynamism of Western Culture (Cambridge: MIT Press, 1968), pp. 75-94. Throughout Zen and Western Thought, ed. William R. LaFleur (Honolulu: University of Hawaii Press, 1985), Masao Abe contrasts the personalistic "homocentrism" of Christianity with the cosmological "dehomocentrism" of Zen Buddhism. Concerning the homocentrism of Christianity, an exception should, I think, be made of the "Sophianic theology" of the Russian Orthodoxy. Cf. Nicolas Zernov, The Russian Religious Renaissance of the Twentieth Century (New York: Harper and Row, 1963), pp. 285-86: "The fundamental conviction of the Russian religious mind is the recognition of the potential holiness of matter, the unity and sacredness of the entire creation, and man's call to participate in the divine plan for its ultimate transfiguration. These ideas can be grouped under the name of Hagia Sophia, Holy Wisdom, the vision of which has never faded out in the long evolution of Russian Christianity. . . . By their association of the Divine Wisdom with the God-Bearer, the Russians manifested their search for the link between the Mother of the Incarnate Lord and Mother Earth whose chosen daughter was the Virgin Mary. To the Russians, she appeared to be the purest and most holy of all human beings, the person in whom the entire creation found its perfect representative and authentic spokesman" (italics added).

19. Vincent Scully, The Earth, the Temple, and the Gods (New Haven: Yale University Press, 1962), p. 7.

20. See Selected Writings of Francis Bacon, ed. Hugh G. Dick (New York: Modern Library, 1955).

21. For Heidegger's discussion of technology, see The Question Concerning Technology and Other Essays, trans. William Lovitt (New York: Harper and Row, 1977).

22. Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought (Cambridge: MIT Press, 1977), p. 116.

23. See From Max Weber: Essays in Sociology, trans. and ed. H.H. Gerth and C. Wright Mills (New York: Oxford University Press, 1946), pp. 129-56. Morris Berman takes up on this Weberian theme of the "disenchantment of the world" and proposes the transformation of it in The Reenchantment of the World (Ithaca: Cornell University Press, 1981).

24. From Max Weber, p. 139.

25. Understanding Media (New York: McGraw-Hill, 1964), p. 18. See also his magnum opus, The Gutenberg Galaxy: The Making of Typographic Man (Toronto: University of Toronto Press, 1962).

26. See Science and Civilization in China, 5 vols. (Cambridge: University Press, 1954-1983).

27. In The Minimal Self (New York: W.W. Norton, 1984), Christopher Lasch lashes out and deplores what he calls the "siege mentality" and "survivalism" including the ecology movement. While I agree with his positive tone, I question his minimization of the issue of survival.

TECHNOLOGY AND THE HEALING OF THE EARTH

Thomas Berry

Of all the issues we are concerned with at present the most basic issue, in my estimation, is that of human-earth relations. A multitude of interhuman issues at the national and international levels also confront us; but even at their worst we can probably survive them much better than we can survive continued degradation of the earth in its basic life systems. The 20th century has eliminated the terror of the unknown darknesses of nature by devastating nature herself.

Our ulitmate failure as humans would be to become, not the crowning glory of the earth, but the instrument of its degradation. We have contaminated the air, the water, the soil; we have dammed the rivers, cut down the rain forests, destroyed animal habitat on an extensive scale. We have driven the great blue whale and a multitude of other animals almost to extinction. We have caused the land to be eroded, the rain to be acid. We have killed the lakes as habitat for fish.

We are playing for high stakes: the beauty and grandeur and even the survival of the earth in its life-giving powers. From being admired and even worshipped as a mode of divine presence, the earth has become despoiled by human presence in great urban population centers and in centers of industrial exploitation. We have also trivialized nature in vacation areas.

In this context we must ask what are the real gains for the human --the automobile, our urban centers, our space exploits,

our communication skills? Whereas the infrastructures of nature constantly renew themselves from within, our infrastructures dissolve in the corrosive acids of the environment or break under the continuing strain imposed upon them.

Are we really moving into a wonderland so magnificient that it is worth such a destructive presence to the natural world? Is this the only way to survive, to provide the food and shelter and clothing and energy that we need? What benefit is worth giving up the purity of the air we breathe, the refreshing water we drink, the life-giving soil in which our food is grown?

This critical view does not indeed give adequate consideration to the great gains in human knowledge and the mitigation or elimination of many human miseries achieved by our new sciences and technologies. But over against these benefits we must inquire into the new and perhaps greater and more universal difficulties we are causing.

Until recently we have never reflected adequately on the larger consequences of our industrial processes or their real meaning. For some of us the new technologies have allowed us to make fortunes, for others it provided the opportunities for jobs and for making a living. For all of us it offered an expansion of life and understanding, although this enlargement often meant the extinction of sensitivity and the loss of contact with the world of natural forces, its spontaneities, and the expansion of mental and emotional life it offers us.

This is not to say that the pre-industrial world is always benign, always responsive to human need. The natural world is a

violent world of volcanic explosions, of withering drought and onrushing floods, or hurricanes that come in from the seas and set everthing awash before them. There are frightening winters as well as enervating summers.

All this must be factored into the equation that we are considering. How are we to choose our way without bringing on disasters greater than those we avoid? There is a tendency to exalt the bright side of industry over against the dark side of nature or to exalt the bright side of nature over against the dark side of industry. In reality we need to compare bright with bright and dark with dark.

What can be said is that since the rise of the scientific technologies of the 1880s and the rise of corporate enterprises such as Standard Oil, Westinghouse, General Electric, U. S. Steel, the automotive, petro-chemical, electrical, and communications industries, humans have gained an "ascendency," such that, with the coming of the nuclear age, we have finally developed the capability of determining whether the earth shall live or die in many of its major life systems. Thus, a unique situation has developed. Today we are certainly more aware of the larger consequences of our actions, the real price we are paying for the technological-industrial processes that presently envelope our world. But it is a situation that is still not getting the attention it deserves, even though we can now discuss the issue with greater understanding and less emotional reaction than ten years ago.

In mentioning our present situation we must also note that humans have, at least since the rise of agriculture at the

beginning of the neolithic period some 12,000 years ago, been putting a certain stress on the natural world. This stress increased considerably with the rise of the classical civilizations of the Eurasian, African, and pre-Columban American continents. The cutting down of the forests of China, begun over 3,000 years ago, has continued ever since, with an erosion of the soil so great that the ocean off China for fity miles is known as the Yellow Sea. While part of this is due to natural causes, a major part is ultimately due to human intervention. So, too, with the classical Mediterranean world of Palestine, North Africa, Greece and Rome, human presence has degraded the life systems continuously over the centuries.

We are, then, continuing a long human tradition developed with special genius in Europe, and then broght to the North Amercian continent. And thus, we are now concerned with "just" the most recent and most virulent phase of a long-standing civilizational problem, that of human-earth relations --the most basic of all issues before us and the source of many inter-human problems that also confront us.

Ultimately it is not an American or European problem, but a species problem. How should humans live upon the earth in a mutually enhancing relation? How can progress be shared by all components of the planet? Can there be true or lasting progress, if it is not shared on a comprehensive scale? Is legitimate human development necessarily a degradation of the natural world?

It would seem that the life systems of the earth did

flourish within the larger pattern of its development prior to human existence. Although this development involved the rise and disappearance of species, the sequence of life expression on the more comprehensive scale continued its expansion, even arching over the periods of widespread species extinction at the end of the Paleozoic, some 220 million years ago, and the extinctions at the end of the Mesozoic, some 65 million years ago. In both these cases new developments took place that were remarkably successful in the expansion of living forms.

While some parallels can be drawn, the differences with our present situation are so great that we must, in my opinion, say that the extinction we are bringing about, on its scale, in its conditions and in its consequences, is something quite different from those earlier extinctions and cannot be judged by over-simplified parallels. In any case, we are currently dealing with a unique problem, the problem of a species with human intelligence and its consequent powers for conscious interaction within the larger earth process, its powers for controlling this process, and its powers for negating this process in many of its aspects. We still have not discovered at what level of development the human and the natural can co-eixst in a mutually enhancing manner.

Whereas many biological and theoretical studies of the human species in its relation to other species have been done, few studies deal with the more practical problems of the human and our technologies at the species level. We discuss ethnic groups, cultures, nations, social groups, yet the problems with which we are presently concerned will require, I think, a new and more

radical reassessment.

This reassessment began with the work of Rachel Carson, who in 1962 published her book on the chemical poisoning of the North American Continent under the title, Silent Spring. Chemical engineering was central to all the basic technologies of this period. It was also the most deadly. This was the basic issue that emerged at the center of the reassessment process, although it was by no means the only issue. Responses to the situation can be summarized in terms of four groups that have developed in the past two decades.

The first and by far the dominant group is entranced with the sense of continuing progress, if not toward wonderland, then toward a constant improvement of the human condition through our scientific industrial processes. This group has almost no consciousness or sensitivity to the degradation of the earth that has been taking place in the 20th century, especially in the post-WW II years when chemical engineering, electronic and nuclear engineering, space engineering, aeronautical and agricultural engineering took control of the North American continent and all its living forms. Surely, there have been abundant benefits --inventions, jobs, washing machines, refrigerators, telephones, travel, education, entertainment, knowledge of world affairs. Yet this group seems devoid of any appreciation of the disturbance caused by brash human intrusion into the ecosystems of nature that evolved so slowly over some hundreds of millions of years.

When faced with the difficulties and dangers resulting as a

consequence of the industrial process, individuals such as Julian Simon and Herman Kahn say that we should press on with our present industrial processes. The argument is that the crisis is exaggerated, that each generation in this country has had a better life than the preceeding generation. Even with our national debt rising beyond two trillion dollars, with our failing infrastructures, our declining forests, our eroded soil, and tens of thousands of hazardous waste sites, even with all this, they insist that we should press on in the existing patterns of production and consumption.

Recently a new period of the entrepreneur has arrived. Earlier the great industrial leaders such as Rockefeller, Vanderbilt, Carnegie, Hill, Gould, Morgan and Mellon established the corporate and financial context within which the industrial-technological processes took place at the end of the 19th century and the beginning of this century. This, in turn, was followed during the first part of the 20th century by the period of Westinghouse and General Electric, Ford and General Motors, Dupont and Dow, and Standard Oil. Then after WW II came I.B.M., Burlington Mills, the new space and military industries along with the new food industries, all exploitive and dependent on the new technologies.

Today with the rise of new technologies comes a new mystique of the corporate enterprise as presented by Thomas Peters and Robert Waterman in their book, The Search for Excellence, a glorification of the new humanistic corporative enterprise. In Lawrence M. Miller's American Spirit we find another presentation of this new mystique for American corporate culture. This

mystique is absorbing the mythic and cultural language and even the attitudes and emotions formerly associated with our religious and humanist traditions. This is reflected in such terms as corporate culture, the mythic meaning of the enterprise, the soul of the establishment, the belief structures. All of this in an effort to overcome an instinctive awareness that the corporation is in the business of seducing the consumer while plundering natural resources and poisoning the environment --not intentionally of course. And that is the most poignant aspect of our times, the dedication of good and intelligent and competent persons to the improvement of the human situation, but individuals who do not understand the real consequences of what they are doing. They are totally dedicated but simply wrong in their judgment.

This sharp critique of the industrial process should be slightly mitigated by recognizing current efforts to limit the damage being done to the environment. Some beginnings have been made to lessen pollution, to control harmful emissions, to neutralize toxic or hazardous wastes or to contain them until they lose their potency.

Government is finally enforcing such controls. No longer can new industrial sites be established without consideration of their acceptability in terms of their impact on the environment. Corporations themselves and engineers through their professional training are beginning to learn that human activity is most effective and most enduring when it is in accord with the natural functioning of the ecosystem into which it is inserted. The earlier lack of responsibility is no longer acceptable. On

occasion leading figures in the corporate structures of our society even meet with professional ecologists and with specialists in various fields of the natural sciences to consider the gains and losses involved in carrying out the industrial enterprise.

We must remember, too, that society itself, especially in America, has supported the industrial process with enthusiasm as the way to a better life. With few exceptions our society has considered the industrial process as the way into the future. We have been entranced with the myth of progress, unlimited progress, progress that would lead beyond the existing human condition to something infinitely better, to a wonderland. Such has been the seductive theme of almost all our advertising.

Thus, a closed cycle of production and consumption has been established which, unless altered, will go on either until the natural resources upon which it is based are exhausted or until the poisons inserted into the environment are fed back into the system. We are so committed to this industrial cycle, so alienated from the needed knowledge or the willingness to withdraw from this cycle back into the ever-renewing cycle of the natural world, that even when we begin to experience the impending peril, we feel that we must cling to these "established" or "traditional" ways, ways that have become, as it were, a kind of salvific process. We feel that we must become even more dedicated to the cause, we must intensify our efforts. Thus, a kind of industrial-technological "fundamentalism" becomes prevalent, a fundamentalism that has led to our present political

regime.

This fundamentalism also expresses itself through the military industrial establishment which itself becomes an overwhelming support of the industrial-commercial cycle. At the same time advertising takes on an exaggerated expression both in terms of its volume and its seductive appeal to the deepest and most sacred archetypal forces of the individual. Its presence is so all-pervasive that the populace is surrounded on all sides with appeals through sight and sound in all the media to buy and consume. The appeal is so urgent, so competitive, and so compelling that it begins to take on hysterical dimensions.

For those totally absorbed in the industrial cycle, however, these signs of the times point to an expansion of life into the future, rather than to a need for reintegration into the cycles of nature: With all his commitment to a new information society, John Naisbitt gives no basic indications of the need to reestablish an enduring and sustaining contact with the spontaneities and ever-renewing powers of the earth itself. In Megatrends he speaks of the "sunrise industries" and the new information society, ending the book with the cheer-leader phrase, "My God, what a fantastic time to be alive." Simon in his books the Ultimate Resource and Resourceful Earth applauds the process. Such is how one group is dealing with human-earth relations. This is the group presently in control of the earth and its resources, our consumption habits, our military and its destructive instrumentalities.

A second response to our present earth-human situation is a negative critique based on the humanistic and social consequences

of our present technological-industrial processes. Among the most incisive and comprehensive of such critics is Jacques Ellul. In his Technological Society he outlined the invasion of the technocratic process into every phase of human life, the imposition of a technosphere on the biosphere and even on the psychosphere with its progressive devitalization and dehumanization of life. Theodore Roszak, in The Making of a Counter Culture, identified the youth revolt of the late 1960s with its opposition to technocracy. His view that the technocratic process was giving way to a more organic sense of human-earth relations was later expressed in Where the Wasteland Ends. Ivan Illich provides a stinging indictment of technological society in a series of writings concerned with the medical profession, education, energy production, and other aspects of contemporary life. Dorothy Day and Peter Maurin, the socialist party of Norman Thomas, Lewis Mumford, The Papal Encyclicals --all these form a moral judgement upon the inequality in carrying the burdens and sharing the benefits of the industrial order. They also deal extensively with the deleterious consequences of the technological order for the humanistic and spiritual dimensions of life.

The consequences for the natural world, however, do not appear prominently in their critique nor in the critique given by the Labor Movement. The Labor Movement in Capitalist countries, the Socialist Movement and the Communist Movement are all heavily committed to the technological-industrial process. For them, it is a question of jobs, of sharing wealth, of a more equitable

place in society. Smokestacks mean work and money and housing, food and clothing, economic survival and education. Acid rain, contamination of rivers, paving over of land, industrial waste, dying fish and birds, these are distant, marginal, extraneous. If that is a condition for survival in the real world, then, they say, so be it. Romantic idealism toward the natural world belongs to a former world of dreams, illusion, and escape from reality.

A third way of dealing with human-nature relations is represented by those who critique our technological-industrial society because of its disturbance of the natural world in its most basic life systems. The ultimate source of evil in the existing order of life is its homocentric norm of reality and value. This third group insists that nothing very helpful can be achieved until we move away from a homocentric to a biocentric norm.

A consciousness of man's disturbed relationship with nature was expressed as early as 1782 by Hector St. John de Crevecoeur in his Letters of an American Farmer. This theme of human disruption and antipathy toward nature was subsequently dealt with in the novels of James Fennimore Cooper and in Herman Melville's Moby Dick. The earliest clear suggestions in America of a truly biocentric attitude to the natural world can be found in Henry Thoreau (1817-1862) and in John Muir (1838-1914). Both of these men lived for long periods in natural surroundings, although Muir lived much deeper in true wilderness areas. Both

Thoreau and Muir, however, retained close communications with human society and its cultural traditions. Both believed that the human species was part of the larger community of life and that a mutually enhancing presence was a necessity for the true enrichment of the human.

A complete rendition of American history from the post-civil war period to the present is not necessary here, but it was obviously a period of industrial ascendency, a period of degradation of the basic life systems of the continent with minimal protest. The virulence of the period since World War II has been marked especially by the advance of the large-scale industries noted previously. It was also the period in which great transnational corporations emerged. The entire planet was inventoried, its resources exploited, its ecosystems upset, primordial forests destroyed, native economies distruped. But the post-war period has also been a period of increased ecological consciousness. As noted, Rachel Carson's Silent Spring first identified the disastrous consequences of chemical fertilizers, pesticides, and herbicides on the living world about us. Following this in 1968, The Club of Rome held its first meeting in Rome to assess the global situation, and in 1972 their first report appeared entitled Limits to Growth. Few books have had such a startling impact in awakening America to the absurdity of unrestrained industrial growth. Subsequently the Greenpeace people upon the sea and later the Earth-First people on the land initiated confrontational tactics in saving the wild places and the threatened species of the world. Biologists Anne and Paul Ehrlich warn us in their book Extinction that before the

year 2000 we will likely extinguish over 20 percent of all living species. Rain forests the size of Connecticut are being destroyed each year. Frederick Turner in Beyond Geography: The Western Spirit Against the Wilderness, tells us of the deepest spiritual and humanist origins of our assault on the planet. Assertion of the absolute primacy of the community of life is given by Murray Bookchin who articulates his orientation in terms of Social Ecology. His program is directed against all hierarchical structures of power, generally presented in terms of the human over nature, man over woman, government over people, and the possessors over the non-possessors.

Thus, the effort to present and defend the biocentric norm of reality and value is widespread, but among the clearest and most direct defenders of the biocentric view is the Deep Ecology Movement begun by Arne Naess and later taken up by George Sessions and a number of others. Deep ecology is concerned with establishing a more integral life orientation. Such are some of the leading individuals who have thrown their activities, their scholarship, and their life purpose into saving the living world of nature from industrial-technological destruction.

In addition to these three is a fourth group, a group that is evolving the alternative programs needed for healing the earth and fostering a mutually enhancing human-earth relation. These are the truly creative personalities of the present. They see the need for confrontational methods such as those used by Green peace and by Earth First, but they themeselves pursue a more

positive program. These are the true heirs of Henry Thoreau, John Muir, and Aldo Leopold, the leading personalities who articulated the intimate functional relationship between the human and the natural world.

In the international realm a sequence of important events took place in the 1970s and early 1980s. In 1972 the Stockholm Conference on the Environment took place without immediately evident results. Afterwards, however, on their return home the conference representatives led the way in establishing Environmental Protection Agencies in most of the nations of the world.

In 1980 the World Conservation Strategy: Living Resource for Sustainable Development was published by the International Union for Conservation and Natural Resources in alliance with the United Nations Environment Protection Program and The World Wildlife Fund. This document set forth a program for development in the Third World that would be so integral with the functioning of the natural world that both could continue on a sustainable basis into the future. Nearly a thousand scientists and other experts from more than a hundred nations were associated with this program. This document on strategy was followed in 1984 by a further elucidation given by eighteen experts in ecological affairs entitled: Sustaining Tomorrow: A Strategy for World Conservation and Development.

In 1982 the World Charter for Nature was approved by the United Nations Assembly. This document notes quite clearly that the human world and its civilizations are integral with the

natural world and that recognition and preservation of the natural world is an urgency, if the human community itself is to survive in any vital way.

More immediate to our purposes here are the alternative models of human-nature relations that could remedy or at least modify our present dysfunctional industrial patterns. The most effective of these new models are functioning in relation to food production, energy, housing, architecture, craft skills, waste disposal, sanitation, health maintenance, and forestry.

In all of these new technologies the principal difference with the past is generally one of scale. Little attention has been given in recent years to the monstrous aspects of technologies that increase production in terms of quantitative measurements without perceiving the change in quality that goes with quantitative change. This is especially evident in the automotive industry and its constant effort to increase production and sales with no significant attention to what is happening to the society and to the North American continent as automobiles become inefficient in the cities, poisonous to the air, deadly to the forests, subversive of neighborhood community, and prohibitive as regards other modes of travel such as walking or using a bicycle.

Questions of scale have been given extensive treatment by Kirkpatrick Sale in his book Human Scale. As early as 1957, Leopold Kohr was dealing with "the diseconomies of scale," a principle he explained more fully in his book, The Overdeveloped

Nations: The Diseconomies of Scale, in 1978.

A number of other writers have also dealt with this new awareness of scale and as well as with recent tendencies toward local limited patterns of production, distribution, and the technologies appropriate to a new sense of the local and limited. New styles of interaction between microphase and macrophase modes of functioning need to be developed.

Focusing on more specific issues we might begin with shifts in agriculture away from monocultural, high energy, petrochemical processes to a greater emphasis on organic processes, mixed crops, local markets, permacultures, and year-round food production in solar heated bioshelters. In this context more subsistence gardening would be done by a large part of the population. Even metropolitan areas would, in alliance with nearby regions, become largely self-supporting in their food supply. Since many metropolitan areas are near the coastline the removal of pollution would enable a much larger volume of seafood to become available.

New techniques of food growing would diminish the exploitation of land and crops in third world countries by the more affluent countries. They would also assist countries all over the world to grow their own food. There are few peoples in the world who could not grow their own food, if the land were available to the people; if food were not exploited for foreign exchange needed for investment in industrialization; if the land were properly cultivated; and if expensive packaging and transportation were avoided.

Extensive developments in achieving such integral use of land and natural processes have been made by Wes Jackson at the Land Institute in Salina, Kansas, by John and Nancy Todd at the New Alchemy Institute on Cape Cod, by Robert Rodale with his Regeneration Program in Emmaus, Pennsylvania, by Bill Mollison with his Permaculture Program; by Masanobu Fukuoka with his <u>One-Straw Revolution</u>, a revolution described as a revolution of both Farming and Life Itself.

Robert Rodale's Regeneration Project is especially concerned with food supply. The program focuses on developments that would lead to the local growing and consumption of food and that would reduce energy expenditures not only for growing and processing, but also for packaging, preserving, transporting, and marketing. The Rodale program has conducted extensive studies in all these areas.

These new agricultural processes involve a sensitivity to natural forces which carry out their work spontaneously and freely. The worms work for free and with delight, the sun pours out its light and warmth and energy in abundance, seeds sprout of themselves if given a chance. Ecosystems evolve. If these programs could carry out their promise, we would finally begin to heal the disruption of the earth that began with the neolithic and continued throughout the course of the Classical Civilizations until it reached its ultimate destructive impact in the pathology of 20th century American agribusiness. The very absurdities of such aggression against the soil reveals the true nature and effects of our entire technocratic system. Our

chemistry, transportation, and energy technologies are all involved in this agriculture, as is the educational system, the social ideals, the health system, and the entire culture. Aware of all this, Wendell Berry wrote his classic treatise: The Unsettlement of America: Culture and Agriculture in 1977.

In the energy field Amory Lovins has shown the need for on-site, local production of energy at end-use levels, rather than exclusively through regional power grids, enormous central generating plants, massive dams, and nuclear establishments. Soft Energy Paths, his most widely read work, provides abundant information on this subject, a book that was followed by another powerful study entitled Brittle Power.

Rather than outline other specific programs that have been initiated in various other areas of human activities, it might be best to present the basic principles that govern the new patterns that are being presented as a way of moving toward technologies that will be mutually enhancing for both the human community and the earth process.

The first principle is that human technologies should function in an integral relationship with earth technologies, not in a despotic or disturbing manner or under the metaphor of conquest, but rather in an evocative manner. The spontaneities of nature need to be fostered, not extinguished. Nature has, during some hundreds of millions of years through numberless billions of experiments, worked out the ecosystems that were flourishing so abundantly when humans and human civilizations emerged into being. It is a brash and destructive thing for

humans to intrude on this system without carefully observing just how these ecosystems work and how humans might best function within this context.

Secondly, there is need to realize the order of magnitude of the changes that are needed. Here we are not concerned with some minor adaptations but with the most serious transformation of human-earth relations that has taken place since the classical civilizations were founded. The industrial age has so alienated and so conditioned the human that survival outside the industrial bubble in which we are enclosed is difficult. Yet we must learn survival within the context of a more intimate relationship with the natural world, since the industrial bubble cannot long endure in its present mode of functioning. The urgency is all the greater when we consider that humans through technological cunning have now for the first time attained the power of life and death over the planet in many of its most basic life systems.

Thirdly, sustainable progress must be progress for the entire earth community. Every component of the community must participate in the process. For humans to progress by eliminating, degrading, or poisoning other life systems is not only to diminish the grandeur of earthly existence but to diminish the chances for human survial in any acceptable mode of fulfillment.

One example of integral progress is found in the soils of northern Europe and England. These soils, after millennia of cultivation were, at the beginning of the 20th century, more fertile than they were originally. Only rarely has this accomplishment been equalled in the course of civilization.

Fourthly, our technologies need to be integral. They need to take care of their waste products. Waste disposal should be associated with the process, either the immediate process or a related process. This law of integrity is among the most widely violated. The brazenness of industrial establishments --blasting their refuse into the atmosphere or pouring it into a stream or dumping the trash onto the fertile wetlands-- is difficult to understand.

It is strange that the chemical industry has been so little concerned with what happens to its chemicals once they are used for some isolated limited purpose. What then happens to these deadly substances seems to be of no concern for the industries that produce them. This refusal to deal with its own waste is one of the most universal, most consistent, and most repulsive aspects of our contemporary technologies.

Fifthly, there is need for a functional cosmology, a cosmology that will provide the mystique needed for this integral earth-human presence to each other. Such a mystique is available once we consider that the universe, the earth, the sequence of living forms, and the human mode of consciousness have from the beginning had a psychic-spiritual as well as a physical-material aspect. We do not need such extrinsic spiritual interpretations of the earth process such as are sometimes proposed. What we do need, however, is a sense of reverence, a sense of the sacred such as we find with the great naturalists or such as we find with some of the foremost scientists of our times, scientists such as Freeman Dyson, Sir Bernard Lovell, Brian Swimme, or Ilya

Prigogine. Until technologists learn reverence for the earth there will be no possibility of bringing a healing or a new creative age to the earth.

Sixthly, nature is violent as well as benign. Our technologies have a defensive role to play. Nature with its sullen droughts, its devastating floods, its hurricane winds, its termites ready to destroy our dwellings, its plague-bearing animals, its malarial infections, assaults and challenges us, and we need all our skills and effective technologies to defend ourselves against such forces that are ever ready to destroy us.

While these assaults on the human are all-pervasive, nature has so arranged its balance of forces that the remedy is already available. Much of the assault that we perceive as natural is really human in origin. By cutting forests we invite floods, by large monocultural agriculture we invite pest infestation on a massive scale, by pouring chemicals on the land we kill the soil and invite erosion. We could extend the list almost endlessly. Nature is both benign and terrible but always creative in the larger patterns of its actions. The difficulty with our technologies is not that they have a dark aspect, but that this dark aspect is so terrible that it terminates rather than enhances further life development.

Seventh, our new and healing technologies need to function within a bioregional context not simply on a national or global scale. The functional divisions of the human should accord with the functional divisions of the earth itself and its life forms. The earth is not given to us in a single global sameness. The earth articulates itself in arctic and tropics, in seacoast and

mountain regions, in plains and valleys, deserts and woodlands.

Everywhere, however, life is established on a functional community basis. These distinctive communities can be designated as "bioregions." A bioregion can be described as an identifiable geographical area of interacting life systems that is relatively self-sustaining in the ever-renewing processes of nature. Our future technologies must function primarily on this bioregional scale.

Road building technologies need to take into consideration the region and the integration of its life systems. Road-building that goes along a stream or a river is a dangerous barrier to those living beings who need to get to the water. Many bird species cannot fly across a four-lane highway. A bioregional roadway would be so constituted that walking and bicycling, horseback riding, and animal-drawn carriages could be accommodated. The tyranny of the automobile can no longer be accepted.

Agricultural technologies proper to the region would be developed, the land cared for so that the woodlands and their living inhabitants could once again feel secure. Monocultures would be eliminated as both unnatural and counterproductive.

Bioregional architecture involving construction with local materials and with reference to area climatic conditions and the numbers of people within a community context would appear. All this would develop in accord with principles of designing with nature, not in alienation from or in opposition to nature.

The integrating element in this bioregional context would be

the bioregional culture. The poetry and song as well as the architecture and painting, the construction and the transportation --all would take on the distinctive features of the bioregion. The norm would not be the boxes of Gropius but the more intimate forms suggested by Ian McHarg and Gary Coates. The earth itself would be seen as the primary architect, the primary scientist, the primary educator, healer, and technologist, even the primary manifestation of the ultimate mystery of things.

A person cannot doubt that the technologists of the present are profundly aware of the nobility and the urgency of their work and also of their competence to fulfill their role in the creative tasks that are before us. Neither they nor ourselves can be entirely clear on the specific details of what needs to be done. What we do know though is that the mechanistic patterns of the past are not adequate to the biological problems of the present. We also know that further imposition of our human technologies on the natural world with such disdain for the technologies of nature can only lead to a further impasse in the entire earth venture. We know further that our sciences and technologies are presently needed more urgently than ever. We can do nothing adequate toward human survival or toward the healing of the planet without our technologies. Extensive scientific research is needed, if we are to appreciate the integral functioning of the basic life systems of the planet and enter into a mutually enhancing relationship.

Our Western scientific effort over these past few centuries is the most sustained meditation on the universe ever carried out by any human group. If for a while our science became alienated

from and antagonistic to the more humanistic and spiritual intepretations of the existing order of things, this was apparently a necessary interlude, a need for distancing to attain a wider and more authentic understanding. After the distancing a new intimacy, after the mechanistic a more biological sensitivity, after damaging the earth a healing. We need only look at the surrounding universe in its more opaque material aspects; look at it, listen to it, feel and experience the full depths of its being. Suddenly its opaque quality, its resistence falls away. What seemed so opaque and impenetrable suddenly becomes radiant with intelligibility and powerful beyond imagination. In this way has the work of the scientist been spoken of by Brian Swimme in terms of a shamanic journey into a strange and distant world. As with the shamanic personality so too "the scientist has returned to the larger culture with stories, awesome and frightening, but stories that serve to mediate ultimate reality to the larger culture."

So in our times technologists are discovering ways of interacting with this awesome inner world of mysterious forces. What we might hope for is not that technologists refuse to enter this world but that, as they participate in its powers, they become increasingldy sensitive to those larger patterns of life into which these powers are organized, not simply into individual life forms but into those living communities that are indeed resilient but also extremely vulnerable to disruption by insensitive humans.

When we ask the more comprehensive question of where the

human fits into the earth process, the answer is simple: The human is that being in whom the earth community reflects on and celebrates itself in conscious self-awareness. The earth is a celebratory event. The end and purpose of all science, technology, industry, manufacturing, commerce, and finance is celebration, planetary celebration. This is what moves the stars through the heavens and the earth through its seasons. The final norm of judgement concerning the success or failure of our technologies is the extent to which they enable us to participate more fully in this grand festival.

TECHNOLOGY AND HARMONY WITH NATURE:
A RESPONSE AND COMMENTARY

Donald St. John

First, let me congratulate my three colleagues for outstanding and thought-provoking papers. My response will cover three areas: 1) a summary of the main ideas in the papers, 2) a comparison of the differing viewpoints, and 3) brief commentaries of my own in response to the above. Since Professors Berry and Jung address themselves to roughly the same topics and set forth their own positions in addition to critiquing others, I will deal with them together by comparing and commenting on their positions under three topical headings: Problem and Solution, Science and Technology, and Spirituality. Following that I will comment briefly on Professor Katz's paper since it is basically a negative critique of three popular but inadequate views regarding philosophy and environmental policy.

The Problem

Professor Berry views our primary problem as one of environmental degradation. He takes a cultural-historical approach on a species level. Ever since the rise of civilization, the human presence on the planet has increasingly placed a strain on the biosphere. Today we are heirs of a civilizational problem and especially of a problem that has accelerated in the last century due to the increase of human

power brought about by scientific knowledge, technological advances, and the pressure from ever-larger populations. Today we are in an especially virulent phase of our relation to the earth.

The Solution

We must radically reassess our present direction if we are to live as a species in a "mutually-enhancing" relationship with the planet. What is needed is: 1) a less anthropocentric view of progress and development that includes the progress of the whole earth community, and 2) a change in the scale, types, and forms of development in the direction of bioregionalism, appropriate technology, and a less wasteful and unjust distribution of human goods. What is needed is a post-industrial form of intimacy with the earth after a period of distancing and destruction.

Comment

My problem with Professor Berry's suggestions is in his overly optimistic reading of history and its direction. The urgency of the present situation is such that if we do not turn around within twenty-five years, no "mutually-enhancing presence" will ever be possible. For example, many predict that half of the species now alive will be extinct by century's end. Their "presence" will be lost forever. Furthermore, topsoil is blowing or washing away at the rate of millions of tons per year. It cannot be replaced in any reasonable time-frame. Nor can the aquifers, such as the great Ogallala aquifer be refilled. Demographers predict that by the middle of the next century the

earth's population will reach ten billion people. One could continue with this familiar litany. Can we, therefore, pin our hopes on such things as the bioregional movement and a shift to appropriate technology? There are powerful vested interests at work, including nation-states and multinational corporations. One could just as easily look at the same evidence that Professor Berry has and predict a continuance in the same direction, rather than a movement from a phase of distance to one of intimacy.

The Problem

Professor Jung takes a philosophical rather than a historical approach. For him the problem is one of the level of thought; our thinking is hopelessly anthropocentric and geared to an ideology of progress. Scientific and technological thinking reduce the earth to its use-value where knowledge-as-power both dominates and exploits it. As of late, we have even abandoned moral thinking, replacing it with technological thinking wherein the means becomes the end.

The Solution

We need an alternative paradigm which does not reduce the moral nature of the human to natural determinism, not nature to human use. It is a paradigm of harmony wherein the human and natural orders are attuned to one another and wherein the human achieves harmony with itself. By critiquing autonomous technology, humankind breaks its servitude to the technological master and recovers its essence as a morally responsible agent. Jung suggests the Sinitic model found in taoists and Confucianists as an alternative to the western-dominant model.

Comment

In the end, Professor Jung's hope, if there is one, lies in individual transformation of thought and action. His characterization of the threat (autonomous technology ruling economic and social systems) and his suggested means of disarmament are disporportional. Autonomous technology, one would think, once in place, as much dictates and forms our consciousness as it manifests it --even more. More is needed, then, than individual reattunement. If autonomous technology is "guilty," then something must be done at this objective, systemic level before we can recover our own power as moral agents.

Science and Technology

Professor Jung suggests that although technology was originally an instrument of human moral agents, it has since become an autonomous sytem in which humans are functionaries. We continue, however, to conceive of technology within the original framework, which reflects a lag in our moral thinking. We must break out of this shallow thinking and adopt a "deep ecology" whereby we stop the process of rationalization and the disenchantment of nature and reassert ourselves as moral beings. Science, for Jung, is an inadequate way of approaching or relating to nature. It has been linked from the beginning with a violent, reductionistic approach to the universe which desacralizes nature. Science is a way for humans to extend their domination of nature and make it accessible to technological exploitation.

While Professor Berry admits that we have gone through a period of distancing from the earth led by science and technology, he sees a movement toward a position of intimacy. Science, however, has a value as "the most sustained meditation on the universe ever carried out by any human group." Science can foster intimacy by giving us a more adequate and profound understanding of the way nature functions in itself so that our technologies can be less violent and more benign. Science gives us a new cosmological story that can deepen our rootedness in natural processes and help us understand our place within the larger process. This will help awaken a sense of reverence for the earth.

Comment

Whereas for Jung technology is the problem, for Berry it is a problem because of its scale and the present societal structures in which it functions. One would hope from both panelists a more concise description of the connection between technology and present economic and political systems. The focus would then shift from broad philosophical or historical considerations, valuable as they are, to a framework wherein economic justice and ecological well-being would be related. Certainly such considerations as efficiency, profit, and political power are important in the understanding of how science and technology actually operate for the destruction of nature, as well as the oppression of people.

Spirituality

The key term in Professor Berry's spirituality is "mutually-enhancing presence." Berry draws upon insights regarding the sacredness of nature found in certain religious traditions and combines these with and stimulates them by the "mediation on the universe" that is science. In addition, an appropriate technology operating in this framework can sensitize us to the larger patterns of life so that their presence might be assured. As the self-reflective consciousness of the earth, the human is not to exploit or devastate nature as if it functioned apart from it, but to celebrate with nature the ultimate mystery and gift of existence. Reverence should be our basic attitude.

Professor Jung similarly agrees that reverence should be our basic attitude. This attitude is extended to the natural world as Geopiety and to the human world as Homopiety. Together these become the new Ecopiety that will attune us to all of reality in a state of Harmony. Harmony does not deny differences or levelize all beings but exhilarates in diversity and is enriched by it.

Comment

Berry seems to want to establish a species spirituality and asks us to discover "at what level of development the human and the natural can be present [with] each other in a mutually-enhancing way." The question, of course, is how we would know what such a state actually is or what it would mean? How do we know what is enhancing to nature? Perhaps, as some suggest, nature would be most enhanced without the presence of humans. It

seems that we have already reached a point--or will reach it very soon--where much of nature will be irredeemably lost and therefore not able to participate in such a state.

Professor Jung, despite characterizing his position as one of "deep ecology," does not seem to escape the bind of anthropocentrism. His concept of Harmony is one of a human-earth harmony and of a human-human harmony, but not of nature's harmony with itself (or with the human from nature's perspective). This observation is only made to point out that we need to be more judicious and precise in our use of "anthropocentrism." Furthermore, one must speak of the Harmony of human communities with one another. This, again, brings us into the realm of economics and politics.

I must deal with Professor Katz's paper separately, since it differs from those of Professors Berry and Jung both in approach and content. It seems to be a critique of three anthropocentric philosophies regarding the human-earth relationship. His critique centers on their ability or inability to help environmental policy makers and other decision-makers. He finds them to be vague, general, and basically irrelevant to concrete decision-making because of their anthropocentrism. Unfortunately, Professor Katz does not set forth his own position, which I assume would overcome the shortcomings in the other positions. This might have provided a third view to compare with Berry and Jung.

Since I am left with the unenviable task of critiquing a

critique, I will only mention a few problems and possibilities in Professor Katz's paper. The overriding problem is the characterization by Professor Katz of the three opposing viewpoints. They are either strawdogs set up to be knocked down or they are simply examples of three misguided popular notions. In no case can they be seriously taken as reputable philosophical positions. However, one is led to believe that we are, indeed, dealing here with the likes of Whitehead, Bateson and Shepard. If Professor Katz had simply said that we are dealing with popular misconceptions, then his paper would have been more focused. But to begin with a promise to do serious philosophical work and then set forth such shallow positions makes what could have been an excellent paper into one requiring much more development.

Certainly one can see where anthropocentric philosophies would fail to set forth an understanding of nature in itself and that an ecocentric (or even theocentric) perspective is much needed. The problem, however, is that decision-makers in the real world <u>are</u> anthropocentric and, if philosophers are to change to make themselves more relevant to this group, the direction of change suggested by Dr. Katz seems counterproductive. Perhaps the emphasis should be on the decision-makers and the changing of their perspective rather than only on the philosophers and their lack of concreteness. A further problem is that these decision-makers function within an economic, social, and political system that embodies values inimical to nature and its well-being. Simply shifting from anthropoecentric to biocentric or ecocentric philosophies leaves the situation intact.

This leads us to another question. Is the problem merely that we do not understand nature as well as we do humankind, or that we humans disagree violently over what it is to be human and what type of society we should have? One could have all the information one would ever need about how human actions affect a particular rainforest and about how that rainforest functions in itself and yet still decide that it "ought" to be cut down to reduce the international debt of Brazil. What is really needed is an understanding of the human-earth relationship that links a socioeconomic critique with a biocentric perspective so that those structures that most disregard the natural order can be identified and a more ecologically sound system suggested.

Professor Katz performs a valuable service by calling our attention to the gap between lofty metaphors about nature and the concrete decision-making process. What we need is <u>both</u> a move away from an anthropocentric philosophy and a move away from systems that define the role and goal of policy in such a narrow fashion.